

# MGP Pro

## HDCP-COMPLIANT MULTI-WINDOW PROCESSORS

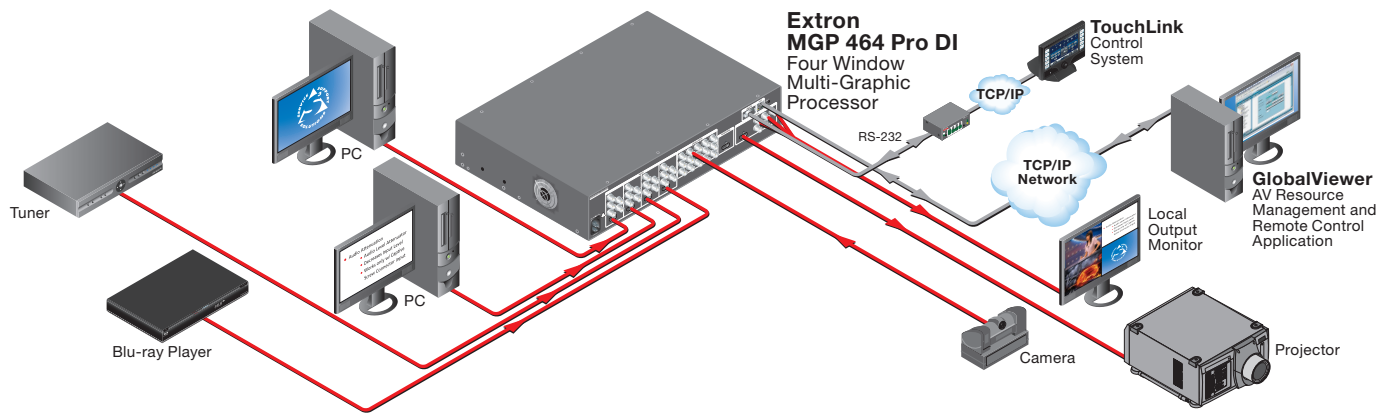
Two and four window high performance graphics processing for professional multi-image presentations

- ▶ Combines digital and analog input sources:
  - HDMI
  - 3G/HD-SDI
  - RGBHV, RGBS, RGsB
  - Component video
  - S-video & composite video
- ▶ HDCP-compliant HDMI output and RGB/component video
- ▶ Key Minder® continuously verifies HDCP compliance for quick, reliable switching
- ▶ HDMI background video input
- ▶ Window transition effects



**Extron Electronics**  
INTERFACING, SWITCHING AND CONTROL

# Introduction



The Extron **MGP 462 Pro** Two Window and **MGP 464 Pro** Four Window Multi-Graphic Processors are powerful, high resolution graphics processors that enable the simultaneous display of multiple images on a single screen. They are ideal for applications demanding critical quality graphics and video presentations, including command and control centers, videoconferencing, medical facilities, courtrooms, and boardrooms. Full HDCP compliance at all HDMI inputs and outputs assures worry-free presentation of protected content. The MGP Pro combines high performance graphics scaling with flexible and customizable picture-in-picture functionality.

A wide range of input sources can be accommodated, including HDMI, 1920x1200 computer-video, composite video, HDTV 1080p/60, and 2K. The MGP 462 Pro and MGP 464 Pro are also available with HDMI and 3G/HD-SDI inputs. Any of up to 19 available inputs can be scaled and placed in any of up to four windows for picture-in-picture display. Both models offer a variety of output resolutions including computer rates up to 1920x1200, HDTV 1080p/60, and 2K on the RGB / component video and HDMI outputs.

To enhance and simplify integration of sources and displays, the MGP Pro features Key Minder®, an Extron-exclusive technology. For HDMI signals with protected content, Key Minder authenticates and maintains continuous HDCP encryption between input and output devices to ensure quick and reliable switching. When receiving an HDCP-encrypted HDMI input source, the MGP 462 Pro and MGP 464 Pro display a green screen on any video output connected to a non-HDCP compliant display. This provides immediate visual confirmation that protected content cannot be viewed on the display.

An advanced feature set enables custom multi-image displays, including picture-in-picture window positioning, size, zoom, priority, image freeze, bordering with selectable colors, and text labeling. The MGP Pro incorporates picture and window fine tuning controls for unlimited picture-in-picture customization. Windows can appear and disappear using elegant effects, including wipes and dissolves for enhanced, professional quality multi-image presentations.

With the integrated Graphic Still Store, screen captures of the current output can be stored for use as presentation background images. Alternatively, BMP bitmap graphics can be uploaded from a PC via the Ethernet port, and recalled as a background. In addition, live video from an HDMI source can also serve as the background to any presentation. Images captured on the MGP 462 Pro and MGP 464 Pro can be downloaded to a PC through Ethernet for archival use.

The MGP 462 Pro and MGP 464 Pro feature full front panel controls for comprehensive, user-friendly access to all functions. Remote control is available via RS-232 with Extron SIS™ - Simple Instruction Set. Ethernet control enables remote management and support from any computer with a Web browser.





# Overview

## Image freeze control

Any selected input for each picture-in-picture window can be frozen, enabling extended viewing for analysis.

## True input matrix

Integrate up to 19 input sources, and then route any input signal to any or all on-screen windows.

## Picture-in-picture memory presets

Custom picture-in-picture window configurations can be conveniently saved and recalled.

## LCD interface

The user-friendly easy-to-read LCD display simplifies operation and control.



MGP 464 Pro DI Front

## Back-lit input selection buttons

Input selection buttons are easily identifiable using back-lit buttons with clear overlay labels, enabling simple front panel operation.

## Window selection buttons

These buttons enable selection of windows for picture and window adjustments.

## Menu and Next

The Menu button steps through the setup menus, while the Next button navigates within each setup menu.

## Picture and window adjustments

Adjustments for picture color, tint, brightness, contrast, and detail, as well as window position, size, and zoom, can be directly accessed through the front panel.

## Universal analog video inputs

The MGP 462 Pro and MGP 464 Pro feature four fully configurable inputs that accommodate a wide range of sources, including RGB, component video, S-video, and composite video.

## Virtual video inputs

Configure these inputs for up to 15 composite video, five S-video, or five component video sources, or various customized combinations of all three formats.

## RS-232 and RS-422 control

The MGP Pro can be controlled and configured via the Extron Windows®-based control program, or integrated into third-party control systems.

## Ethernet control and monitoring

Ethernet control enables the MGP Pro to be managed and proactively monitored from any authorized Web client or IP-based control systems.



MGP 464 Pro DI Back

## High resolution input compatibility

The four fully configurable inputs accept computer-video resolutions up to WUXGA (1920x1200) as well as video sources including HDTV 720p, 1080i, 1080p/60, and 2K.

## HDMI and 3G/HD-SDI inputs

The MGP 462 Pro and MGP 464 Pro are available with four HDMI inputs, or two HDMI inputs and two 3G/HD-SDI inputs, for integration of digital video sources into AV systems.

## HDMI background input

This dedicated HDMI input provides live, high resolution background video for any presentation. Two or three MGP 462 Pro or MGP 464 Pro units may be cascaded for large-scale applications that require six to 12 windows.

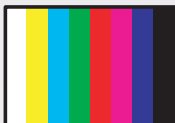
## Analog RGB/Component Video and HDMI Outputs

High resolution picture-in-picture video is output simultaneously as analog RGB/component video and HDMI with full HDCP compliance.

# What's inside the MGP Pro

## Test Patterns

The MGP 462 Pro and MGP 464 Pro offer several test patterns, including those shown below and others such as a crop pattern, ramp, white field, aspect ratio patterns, and a pattern for populating a 4x3 screen with 4x3 images. They also feature a blue-only mode for proper setup of video color and tint levels.



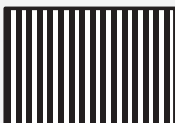
Color Bars (8)



Crosshatch 4x4



Grayscale



Alt Pixels



4x3 Side-by-side Crop



16x9 Side-by-side Crop



16x9 Pattern w/ 4x3 Images



1.85 Aspect Ratio

## High Resolution, Multi-Image Presentations

The MGP 462 Pro and MGP 464 Pro deliver multi-image displays comprising high resolution multimedia and video, including HDTV, for high impact, professional quality AV communication. They feature reference quality scaling and proprietary, high resolution graphics processing for full compatibility with computer-video and HDTV sources, and optimal performance with the latest presentation displays.

## Universal Analog Video Inputs

The MGP Pro features four fully configurable inputs on BNC connectors that accommodate RGBHV, RGBS, RGsB, RGBcvS, component video, S-video, or composite video. High resolution sources can include computer-video signals up to 1920x1200, and HDTV up to 1080p/60 and 2K.

## True Input Matrix Switcher

A built-in matrix switcher allows any of up to 19 inputs to be routed to any, or all, on-screen windows—two for the MGP 462 Pro and four for the MGP 464 Pro. This provides total flexibility in creating and controlling multi-window presentations.

## Custom Picture-in-Picture Windows

The MGP Pro features fully customizable picture-in-picture window configurations. Each window can display any connected source, and can be independently positioned, sized, and zoomed. Available picture adjustments include color, tint, brightness, contrast, and detail. Fine tuning controls on the front panel enable precise adjustments for the needs of the presentation. In addition, colors can be selected for the picture-in-picture background and window borders.

## Graphic Still Store

Graphic Still Store is a powerful feature that captures the current output and stores the image in memory for use as a background. Additionally, BMP - bitmap graphics can be uploaded to the MGP 462 Pro and MGP 464 Pro via the Ethernet port, and recalled as a background. Static images can be integrated with the dynamic video or graphic windows for use in presentations. In addition, captured images can be downloaded to a PC as BMP files for archival purposes.

## Live Video Background

Live, high resolution computer-video or HDTV from an HDMI source can be used as a background to any presentation. The HDMI background input is also useful in cascading two or three MGP 462 Pro or MGP 464 Pro units to create large-scale displays with six to 12 windows.

## Virtual Video Inputs

In addition to the four fully configurable inputs, 15 virtual video inputs are available for component video, S-video, and composite video. The virtual video inputs accept up to 15 composite video sources, up to five component video sources, up to five S-video or five composite video connections, or combinations of all three formats to suit the requirements of various applications.

## Optional HDMI and 3G/HD-SDI Inputs

The MGP 462 Pro and MGP 464 Pro are available with four HDMI inputs, or with two HDMI inputs and two 3G/HD-SDI inputs. These inputs allow easy integration of digital video sources into AV systems, and together with the HDMI output, allow the unit to operate within an all-digital video system with full support for transport and display of HDCP encrypted content. 3G/HD-SDI inputs with format auto-detection facilitate integration of cameras and other professional video equipment.

## HDCP Visual Confirmation

When processing HDCP-encrypted content, the MGP 462 Pro and MGP 464 Pro output a full-screen green signal on any video output connected to a non-HDCP compliant display. This provides immediate visual confirmation that protected content cannot be viewed on the display.

## Key Minder®

The MGP Pro features Key Minder, an Extron-exclusive technology that authenticates and maintains continuous HDCP encryption between input and output devices to ensure quick and reliable switching.

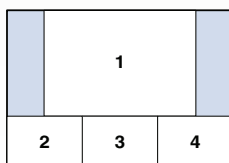
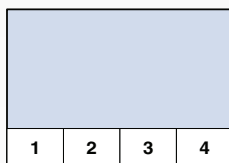
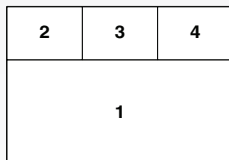
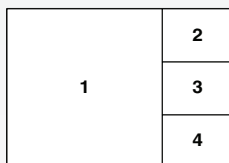
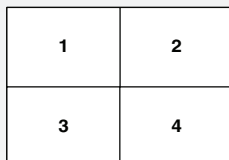
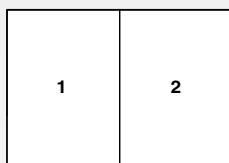
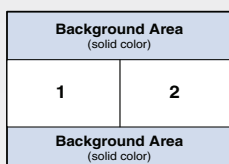
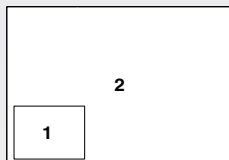
## Transition Effects

For professional quality presentations, windows can be transitioned into and out of the image. Customizable options are available, including dissolves, wipes, and cuts. In addition, cut or slide motion effects can be invoked when window presets are recalled.

# What's inside the MGP Pro

## Window Presets

A total of 128 window presets for picture-in-picture window configurations are available, including factory presets. These can be customized for quick saving of configurations and recall of size, positioning, and priority for both windows.



## Text Overlay

Each picture-in-picture window can be labeled with a text label of up to 16 characters. The text can be uploaded to the MGP 462 Pro and MGP 464 Pro via RS-232 or RS-422 control, or Ethernet. Custom options are available for text positioning, text color, character size, translucent or opaque color background, and text border.

## EDID Emulation

To ensure proper communication with the video source, the MGP 462 Pro and MGP 464 Pro provide a means for specifying the rate of the incoming signal.

## Auto-Image™ Setup

For expedited presentation setup, the MGP 462 Pro and MGP 464 Pro automatically optimize the image to the scaled output rate. This eliminates complex and time-consuming setup procedures.

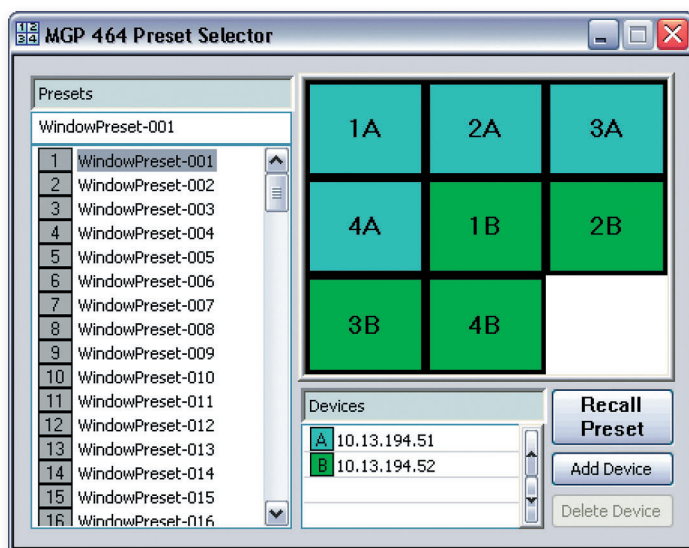
## Ethernet, RS-232, RS-422 Monitoring and Control

Through Ethernet, RS-232, and RS-422, the MGP 462 Pro and MGP 464 Pro can

be controlled and configured via the built-in Web server or Extron Windows®-based control program, or integrated into third-party control systems using Extron SIS™ - Simple Instruction Set serial commands. Monitoring capabilities include exchange of static image files with a PC, as well as remote access to functions and status parameters, including the internal saving and recalling of window presets, as well as picture-in-picture customization and configuration of the virtual video inputs.

## Windows-Based Control Software

The included Windows-based control software provides complete, real-time operation of the MGP 462 Pro and MGP 464 Pro. The software enables control of all functions and configuration options, including window sizing and positioning, virtual video input configuration, and Graphic Still Store. A graphic interface is included for visualization of picture-in-picture windows as they are dynamically sized and positioned.



## Preset Selector Tool

The MGP Preset Selector software lets a user quickly and easily recall window presets. The software can be used on any PC with an RS-232 or Ethernet connection to an MGP 462 Pro or MGP 464 Pro. To recall a preset, the user simply opens up the program, selects any of the 128 available presets, and then clicks a button to recall the window layout. A preview pane is provided which shows a graphical layout of the windows associated with the selected preset.

Up to three MGP 462 Pro or MGP 464 Pro units can be connected to the PC at the same time. The Preset Selector software is especially useful for quickly setting up MGP units that are cascaded together.



# Key Features & Applications

## Graphic Still Store

Graphic Still Store is a powerful feature that captures any currently displayed output, and then stores the image in memory for use as a background. Additionally, BMP - bitmap graphics can be uploaded to the MGP 462 Pro and MGP 464 Pro via the Ethernet port, and recalled as a background.

In teaching hospitals, for example, the MGP Pro seamlessly combines the wide range of high resolution computer-video sources, such as CAT scans, MRI images, and vital signs monitor outputs, with standard definition or high definition, full-motion video. A real-time, high resolution x-ray is displayed alongside a live camera feed of the surgery. Other sources may include an EKG and other measurements from the vital signs monitor, as well as CAT scans, ultrasound, and MRI images, recalled from the hospital's central image management system.

Graphic Still Store on the MGP 462 Pro and MGP 464 Pro is used here to provide a custom background graphic with the patient's name, ID number, and details about the case. This frees the four live windows for display of the dynamic, real-time video and computer-video information vital to the hospital's training mission.

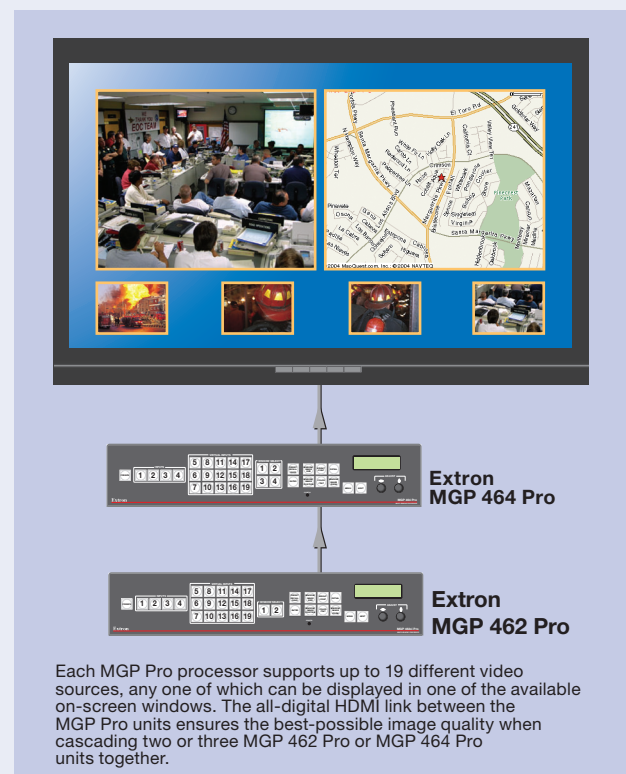
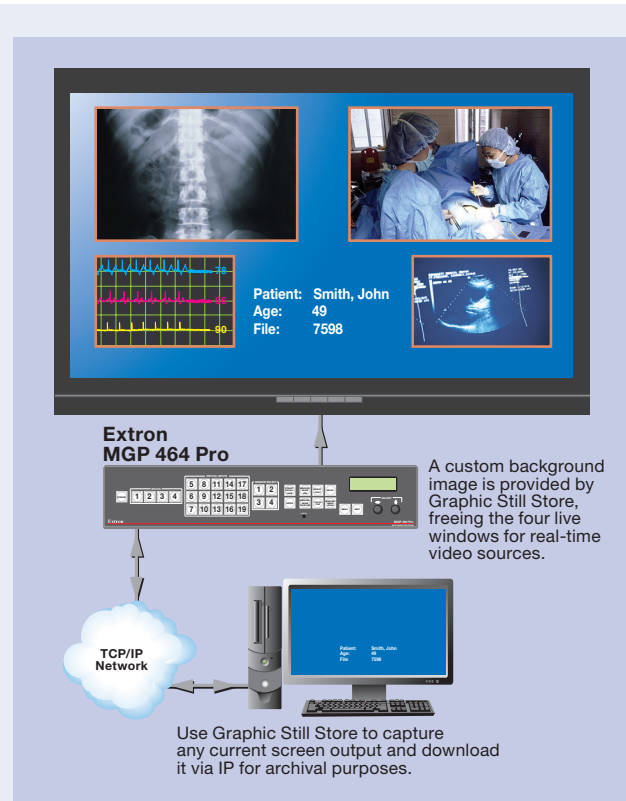
Medical facilities also benefit substantially from the capability to download, through Ethernet, images captured and stored on the MGP 462 Pro and MGP 464 Pro. This secondary aspect of Graphic Still Store is useful in documenting case studies and archiving important visual records for future reference.

## Live Video Background

In addition to Graphic Still Store, live, high resolution computer-video or HDTV from an HDMI source can be used as a background to any presentation. This dedicated HDMI input connection for full-motion background images is useful in cascading two or three MGP 462 Pro or MGP 464 Pro units to create large-scale displays with six to 12 windows.

Fast-paced environments, such as those found in emergency operations and command-and-control centers, require the ability to quickly and accurately display multiple video and graphic images simultaneously. In this example, the display of six windows is created by cascading an MGP 462 Pro and an MGP 464 Pro by connecting the HDMI output of one unit to the HDMI Background Input of the other.

As illustrated, a graphic image of a map, sourced from a PC, provides detailed information about the location of the emerging crisis. Adjacent to the map is a live video feed of the center's director providing response instructions for the operations center staff. Below the two main windows is a row of four small windows showing various live video feeds from the scene, any one of which can be immediately enlarged to fill the screen. Up to 38 video sources, 19 from each MGP Pro unit, are available to the system operator. Depending on the need and application, an additional MGP 464 Pro unit may be cascaded to add four more windows to the display.



# Key Features & Applications

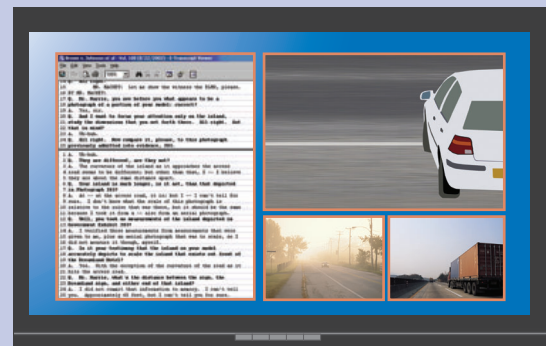
## Videoconference, Distance Learning, and Corporate Applications

The MGP 462 Pro and MGP 464 Pro are used in corporate presentation and distance learning applications to combine near end and far end video sources with high resolution graphics. Here, the main window displays the far end presenter. At the lower left is one of the high resolution data images being presented. Also on screen are windows for the near end video source and additional far end participants. In applications such as this, the text overlay feature of the MGP Pro is effective in identifying the locations and participants from each location. Using serial control or Ethernet, text labels can be customized to the content of each window. With formal presentations, such as those typically found in corporate environments, windows can be set to appear into and disappear from the display using a variety of attractive visual effects, including wipes, reveals, and dissolves.



## Courtroom Applications

For proceedings in a modern courtroom with advanced AV presentation technologies, the MGP 462 Pro and MGP 464 Pro provide lawyers with the ability to incorporate and combine several of their multimedia sources, including evidence documentation, into a powerful, compelling presentation. Illustrated is a prosecutor's three-window presentation of a re-enacted auto collision, alongside a live transcript of the proceeding. The presentation includes an animated re-enactment of the accident scene, presented as a high resolution graphic source from a PC, along with video camera recordings shot on location from the vantage point of each vehicle involved in the accident. The multi-window output of the MGP 464 Pro can be distributed to projectors and flat panel displays located throughout the courtroom for counsel, the judge, the witness stand, and the jury. A second, parallel output is available to record the proceedings for archival purposes.



# Specifications

## VIDEO INPUT

Number/signal type	4 VGA-WUXGA RGBHV, RGBS, RGsB, RsGsBs, RGBcvs, component video (interlaced or progressive), S-video, composite video 4 to 15 (configurable) component video (interlaced), S-video, or composite video 4 HDMI digital video (DI models only) 2 3G/HD-SDI digital video, 2 HDMI digital video (3G-SDI models only) 1 HDMI digital video (Live Background)
Connectors	
Inputs 1-4	4 x 5 female BNC (all models) 4 female HDMI (DI models only) 2 female BNC, 2 female HDMI (3G-SDI models only)
Inputs 5-19	15 female BNC
Live Background	1 female HDMI
Resolution range	640x480 to 1920x1200*, 480i, 576i, 480p, 576p, 720p, 1080i, 1080p, and 2048x1080 *Only the reduced blanking version of the 1920x1200 resolution is sampled at full bit rate.  The 3G/HD-SDI inputs accept only the following resolutions: 720p <sup>5,6,7</sup> , 1080i <sup>5,6,7</sup> , 1080p <sup>1,2,3,4,5,6,7</sup> <sup>1</sup> = at 24 Hz, <sup>2</sup> = at 25 Hz, <sup>3</sup> = at 29.97 Hz, <sup>4</sup> = at 30 Hz, <sup>5</sup> = at 50 Hz, <sup>6</sup> = at 59.94 Hz, <sup>7</sup> = at 60 Hz

## VIDEO OUTPUT

Number/signal type	1 scaled RGBHV, RGBS, RGsB, HD YUV component video 1 HDMI (HDCP compliant) digital video
Connectors	5 female BNC, 1 female HDMI
Scaled resolution	640x480 <sup>1,2,3,4,5,6</sup> , 800x600 <sup>1,2,3,4,5,6</sup> , 852x480 <sup>1,2,3,4,5</sup> , 1024x768 <sup>1,2,3,4</sup> , 1024x852 <sup>1,2,3,4</sup> , 1024x1024 <sup>1,2,3</sup> , 1280x768 <sup>1,2</sup> , 1280x800 <sup>1,2,3</sup> , 1280x1024 <sup>1,2</sup> , 1360x768 <sup>1,2</sup> , 1360x768 <sup>1,2</sup> , 1365x768 <sup>1,2</sup> , 1365x1024 <sup>1,2</sup> , 1366x768 <sup>1,2</sup> , 1400 x 1050 <sup>1,2</sup> , 1440x900 <sup>1,2,3</sup> , 1600 x 1200 <sup>1,2</sup> , 1680x1050 <sup>1,2</sup> , 1920x1200 <sup>1,2</sup>  HDTV: 480p <sup>2,8</sup> , 576p <sup>1</sup> , 720p <sup>1,2,8</sup> , 1080i <sup>1,2,8</sup> , 1080p <sup>1,2,7,8</sup> , and 2048x1080 <sup>1,2,7,8</sup> <sup>1</sup> = at 50 Hz, <sup>2</sup> = at 60 Hz, <sup>3</sup> = at 72 Hz, <sup>4</sup> = at 96 Hz, <sup>5</sup> = at 100 Hz, <sup>6</sup> = at 120 Hz, <sup>7</sup> = at 24 Hz, <sup>8</sup> = 59.94 Hz

## SYNC

Input type	RGBHV, RGBS, RGsB, RsGsBs, RGBcvs, YUV (tri-level or bi-level on Y channel)
Output type	RGBHV, RGBS, RGsB, YUV (tri-level or bi-level on Y channel)
Input standards	NTSC 3.58, NTSC 4.43, PAL, SECAM, SMTPE 292M, SMTPE 424

Input level	2.75 V to 5.0 Vp-p for RGBHV or RGBS 0.6 Vp-p for component video tri-level sync 0.3 Vp-p for component video bi-level sync or RGsB
Output level	0.6 Vp-p for component video tri-level sync 0.3 Vp-p for component video bi-level sync or RGsB TTL: 5.0 Vp-p, unterminated for RGBHV, RGBS

## CONTROL/REMOTE – PROCESSOR/DECODER/SCALER

Serial control ports	(1) RS-232 or RS-422, female 9-pin D connector (1) RS-232, 2.5 mm mini stereo jack
Baud rate and protocol	300 to 115200 baud (default: 9600), 8 data bits, 1 stop bit, no parity
Ethernet control port	1 female RJ-45 connector
Program control	Extron Simple Instruction Set (SIS™) Microsoft® Internet Explorer, Telnet Extron control/configuration program for Windows®

## GENERAL

Power supply	Internal Input: 100-240 VAC, 50-60 Hz
Power consumption	
MGP 464 Pro models	50.0 watts
MGP 462 Pro models	35.5 watts
Temperature/humidity	Storage: -40 to +158 °F (-40 to +70 °C) / 10% to 90%, noncondensing Operating: +32 to +122 °F (0 to +50 °C) / 10% to 90%, noncondensing
Cooling	Fan, right to left (as viewed from the front panel)
Thermal dissipation	
MGP 464 Pro models	148 BTU/hour
MGP 462 Pro models	110 BTU/hour
Mounting	Rack mountable with included brackets
Enclosure dimensions (per unit)	3.4" H x 17.5" W x 12.0" D (2U high, full rack wide) (8.6 cm H x 44.5 cm W x 30.5 cm D) (Depth excludes connectors and knobs. Width excludes rack ears.)
Product weight	8.6 lbs (3.9 kg)
DIM weight	19 lbs (9 kg)
Vibration	ISTA 1A in carton (International Safe Transit Association)
Regulatory compliance	
Safety	CE, c-UL, UL
EMI/EMC	CE, C-tick, FCC Class A, ICES, VCCI
Environmental	Complies with the appropriate requirements of WEEE.
Warranty	3 years parts and labor
<b>NOTE:</b> All nominal levels are at ±10%.	

Model	Version Description	Part number
MGP 462 Pro	Two Windows, Standard Version	60-1258-01
MGP 462 Pro DI	Two Windows, With 4 HDMI Inputs	60-1258-02
MGP 462 Pro 3G-SDI	2 Windows, 2 3G/HD-SDI & 2 HDMI Inputs	60-1258-03
MGP 464 Pro	Four Windows, Standard Version	60-1259-01
MGP 464 Pro DI	Four Windows, With 4 HDMI Inputs	60-1259-02
MGP 464 Pro 3G-SDI	4 Windows, 2 3G/HD-SDI & 2 HDMI Inputs	60-1259-03

For complete specifications, please go to [www.extron.com](http://www.extron.com)  
Specifications are subject to change without notice.

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