HD-WP-4K-401-C

4K Multi-Window Video Processor with HDBaseT® & HDMI® Outputs

- *Displays up to four video sources on a single HD, Ultra HD, or 4K display*
- *Nine windowing modes consisting of automatic, full screen, PIP, side by side, quad view, 3 up, 3 down, 3 small left - large right, and 3 small right - large left*
- *Automatic mode affords plug-and-play operation without a control system*
- *Professional performance ensures smooth, glitch-free on-screen transitions*
- *Built-in Crestron Connect It™ collaboration system functionality*
- *Automated display power control via CEC, IR, or RS-232 [5,6,7]*
- *Optional control system integration enables fully customizable control*
- *HDMI® and HDBaseT® outputs support versatile system configuration and long wire runs*
- *Supports input and output resolutions up to 4K/30 (4096x2160@30Hz) or WQXGA (2560x1600@60Hz) [1,8]*
- *Supports HDMI, DVI, and Dual-Mode DisplayPort sources [9]*
- *Includes comprehensive built-in EDID and HDCP configuration tools*
- *HDCP 2.2 and 1.4 compliant*
- *Text and image overlay capabilities*
- *Passes Dolby® TrueHD, Dolby Atmos®, DTS-HD®, DTS:X®, and uncompressed 7.1 linear PCM audio [3]*
- *Supports stereo audio de-embedding via a balanced analog audio output [3,4]*
- *Simplified setup through the front panel OLED display or a web browser*
- *High-speed Ethernet LAN connection*
- *Single-space 19" rack-mountable*
- *Universal 100-240V internal power supply*

The HD-WP-4K-401-C enables the display of up to four video sources simultaneously on a single HD, Ultra HD, or 4K display. Parallel HDMI® and HDBaseT® outputs provide flexible connectivity for the display device and other equipment. Input sources up to 4K are supported via four HDMI inputs. Fully automatic operation enables use without a control system, while enhanced operation and custom functionality can be attained through integration with a Crestron® control system.

Video windowing enhances the presentation and collaboration capabilities of any meeting space, allowing multiple presentation sources to be connected and displayed together on screen. The ability to connect up to four Crestron Connect It™ cable caddies (TT-100 series) directly to the HD-WP-4K-401-C affords a perfect multi-window collaboration solution for huddle rooms and classrooms. Any meeting room, classroom, training lab, auditorium, lecture hall, house of worship, or command center can benefit from the use of video windowing, expanding the facility's display capabilities while saving cost by allowing more video sources to be viewed on fewer display devices.

Note: Interlaced video signals are not supported. A Crestron HD-SCALER-HD-E video scaler may be added to any HDMI input to enable support for interlaced video sources on that input. Refer to the specifications for complete input and output capabilities.

Note: Full screen 4K display is supported by Inputs 1 and 2 only. 4K sources connected to Inputs 3 and 4 are automatically downscaled to 1080p.[1]

High-Performance Video Windowing

The HD-WP-4K-401-C is engineered to deliver a professional onscreen experience with crystal clear 4K video quality and smooth transitions. Using Automatic mode, the screen fluidly configures itself based on the number of connected sources. With four sources connected, all four images appear in four equal sized windows that combine to fill the screen. Disconnect or disable one source and the screen reconfigures to display only three windows (two top, one bottom). Connect or select only two sources and they display side by side, while a single source displays full screen.

PIP (Picture-In-Picture) windowing is also supported, allowing one source to be displayed full screen with a second source displayed in an inset PIP window. The size and location of the PIP window can be defined at setup. Additional windowing modes include 3 up, 3 down, 3 small left - large right, and 3 small right - large left. All windowing modes and input assignments can be managed at setup or while in operation using the front panel controls, a web browser, or a control system.

Text and Image Overlay

Each video window can be designated with a custom text label. An additional text field can be positioned at any location on screen to display a static label or a dynamic pop-up message sent from the control system. A custom photo or logo image can also be uploaded to appear at any location on the screen.

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Crestron Connect It™

Crestron Connect It cable caddies (TT-100 series) provide a cost-effective, simple-to-use presentation solution that works seamlessly with the HD-WP-4K-401-C. Simply add up to four Crestron Connect It cable caddies to provide BYOD connectivity and one-touch control for multiple participants around a conference table. Four USB ports on the HD-WP-4K-401-C provide power and communications for each cable caddy.

Note: The HD-WP-4K-401-C does not support VGA or analog audio inputs.

HDBaseT® Output

Its HDBaseT output allows the HD-WP-4K-401-C to connect directly to any display device equipped with an HDBaseT input. The HDBaseT connection requires just one CAT type cable and supports wiring distances up to 300 feet (100 meters), easily accommodating all types of room configurations. The HDBaseT and HDMI outputs may be used simultaneously, providing identical signals at each output with the added benefits of longer cable length and the ability to power an HDBaseT PoE+ powered device over the HDBaseT connection.[2]

The HDBaseT output is also compatible with a Crestron DigitalMedia™ system, allowing for connection to a DM 8G+® receiver, DM® switcher, or DM-DGE-200-C Digital Graphics Engine. Note that the HD-WP-4K-401-C does not provide control of the DM device or any equipment connected to that DM device.[2]

Audio Pass-Through and De-Embedding

When displaying a full screen image of any single input source, that source's audio signal is routed to the HDMI and HDBaseT outputs. A balanced analog audio output is also included to allow stereo audio signals to be extracted from the digital output and fed to a separate audio switcher, processor, or amplifier.[3,4]

Display Control and System Integration

When used without a control system, the HD-WP-4K-401-C provides essential on/off power control of the display device via RS-232 using the onboard COM port, IR using the onboard IR port, or CEC through the HDMI or HDBaseT output. The display device can be configured to turn on automatically when an input source is connected, and then turn off following an adjustable time period after all sources are disconnected.

Adding a control system enables fully customizable control of the display and other devices connected to the HD-WP-4K-401-C via RS-232, IR, and CEC. CEC is supported through each of the onboard HDMI and HDBaseT ports. Integration with a control system also enables integration with Crestron Fusion® Cloud to support centralized control, monitoring, and room scheduling as part of a complete managed enterprise.

Simplified Setup

Easy setup and configuration of the HD-WP-4K-401-C is enabled using the front panel controls or a web browser. Standalone operation is supported for set-and-forget video windowing applications, and for small AV presentation applications with or without the optional Crestron Connect It cable caddies.

SPECIFICATIONS

Video

Windowing Modes:

Automatic – Displays only the active inputs (sync detected) as follows:

- Four active inputs display as quad view
- Three active inputs display as three equal sized windows (two side-by-side at top, one centered at bottom)
- Two active inputs display as side-by-side
- One active input displays full screen

Full Screen – Displays any single input as a full screen image

Picture-in-Picture – Displays any single input full screen with any other input as a scalable, positionable inset window

Side-by-Side – Displays any two inputs as two equal sized, vertically centered windows

Quad View – Displays all four inputs as four equal sized windows (two side-by-side at top, two side-by-side at bottom)

3 Up – Displays three inputs as three equal sized windows positioned as two side-by-side windows above one horizontally centered window

3 Down – Displays three inputs as three equal sized windows positioned as two side-by-side windows below one horizontally centered window

3 Small Left, Large Right – Displays four inputs as three equal sized windows on the left and one larger vertically centered window on the right

3 Small Right, Large Left – Displays four inputs as three equal sized windows on the right and one larger vertically centered window on the left

Note: For each of the windowing modes, the aspect ratio of each window can be adjusted.

Input Signal Types: HDMI® w/4K [1] (DVI & Dual-Mode DisplayPort compatible [9])

Output Signal Types: HDMI w/4K (DVI compatible[9]), HDBaseT® w/4K (DM 8G+® compatible [7])

Maximum Input Resolutions:

Scan Type	Resolution	Frame Rate	Color Sampling	Color Depth
Progressive	4096x2160 DCI 4K & 3840x2160 4K UHD [1]	30 Hz	4:4:4	24 bit
	2560x1600 WQXGA [1]	60 Hz	4:4:4	24 bit
	1920x1080 HD1080p	60 Hz	4:4:4	36 bit [10]

Maximum Output Resolutions:

Scan Type	Resolution	Frame Rate	Color Sampling	Color Depth
Progressive	4096x2160 DCI 4K & 3840x2160 4K UHD	30 Hz	4:4:4	24 bit
	2560x1600 WQXGA	60 Hz	4:4:4	24 bit
	1920x1080 HD1080p	60 Hz	4:4:4	24 bit

Note: Common resolutions are shown. Other custom resolutions (within the maximum limits listed) are supported at pixel clock rates up to 300 MHz. Interlaced signals are not supported.[8]

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Rear View

Audio

Input Signal Types: HDMI (Dual-Mode DisplayPort compatible [9])
Output Signal Types: HDMI, balanced analog stereo [3,4]
Digital Formats: Dolby Digital®, Dolby Digital EX, Dolby Digital Plus, Dolby TrueHD, Dolby Atmos, DTS®, DTS-ES, DTS 96/24, DTS-HD High Res, DTS-HD Master Audio, DTS:X, LPCM up to 8 channels
Analog Formats: Stereo 2-Channel [4]
Digital-To-Analog Conversion: 24-bit 48 kHz
Analog Performance: Frequency Response: 20 Hz to 20 kHz ±0.5 dB;
S/N Ratio: >95 dB 20 Hz to 20 kHz A-weighted;
THD+N: <0.005% @ 1 kHz;
Stereo Separation: >90 dB
Analog Volume Adjustment: -80 to +20 dB
Analog Delay Adjustment: 0 to 150 ms

Communications

Ethernet: 10/100 Mbps, auto-switching, auto-negotiating, auto-discovery, full/half duplex, DHCP, web browser setup and control, Crestron control system integration
USB: "INPUT 1 – 4" host ports enable basic control of the unit using Crestron Connect It devices; service port enables firmware update via USB mass storage device
RS-232: 2-way device control and monitoring up to 115.2k baud with hardware and software handshaking [5]
IR/Serial: 1-way device control via infrared up to 1.1 MHz or serial TTL/RS-232 (0-5 Volts) up to 60k baud [5]
HDMI: HDCP 2.2, HDCP 1.4, EDID, CEC [6]
HDBaseT: HDBaseT Class A, HDCP 2.2, HDCP 1.4, EDID, CEC [6], PoE+
DigitalMedia: DM 8G+, HDCP 2.2, HDCP 1.4, EDID, CEC [6], Ethernet

NOTE: Supports management of HDCP and EDID; supports management of CEC between the connected HDMI and HDBaseT device(s) and a control system

Connectors

HDMI INPUT 1 – 4: (4) 19-pin Type A HDMI female;
HDMI digital video/audio inputs [1];
(DVI and Dual-Mode DisplayPort compatible [9])

USB INPUT 1 – 4: (4) USB Type A female;
USB 2.0 host ports for TT-100 series Crestron Connect It cable caddies

HDMI OUTPUT: (1) 19-pin Type A HDMI female;
HDMI digital video/audio output;
(DVI compatible [9])

HDBT OUTPUT: (1) 8-pin RJ45 female, shielded;
HDBaseT digital video/audio output (DM 8G+ compatible) [2,7];
HDBaseT PoE+ PSE port;
Note: The HDBT output is for connection to HDBaseT or DM equipment only; do not connect to an Ethernet network

AUDIO: (1) 5-pin 3.5 mm detachable terminal block;
Balanced/unbalanced stereo line-level audio output [4];
Output Impedance: 200 Ohms balanced, 100 Ohms unbalanced;
Maximum Output Level: 4 Vrms balanced, 2 Vrms unbalanced

IR: (1) 2-pin 3.5 mm detachable terminal block;
IR/Serial output port [5];
IR output up to 1.1 MHz;
1-way serial TTL/RS-232 (0-5 Volts) up to 60k baud

COM: (1) 5-pin 3.5 mm detachable terminal block;
Bidirectional RS-232 port [5];
Up to 115.2k baud, hardware and software handshaking support

LAN: (1) 8-pin RJ45 female;
10Base-T/100Base-TX Ethernet port

SERVICE: (1) USB Type A female;
Supports USB mass storage devices for firmware update

100-240V~2.0A 50/60Hz: (1) IEC 60320 C14 main power inlet;
Mates with removable power cord, included

Controls & Indicators

PWR: (1) Bi-color green/amber LED, indicates operating power supplied from AC line power, turns amber while booting and green when operating
ONLINE: (1) Amber LED, indicates online connection to a control system via Ethernet
Display: 2x20 character alphanumeric OLED; displays setup and configuration menus, signal information, customizable input/output names
MENU: (1) Pushbutton, opens the setup menu
▲▼◀▶: (4) Pushbuttons, for menu navigation and parameter adjustment
Enter: (1) Pushbutton, applies a change
BACK: (1) Pushbutton, steps menu back one level
EXIT: (1) Pushbutton, exits the menu
HDBT OUTPUT (rear): (2) LEDs, green LED indicates HDBaseT link status, amber LED indicates video and HDCP signal presence
LAN (rear): (2) LEDs, amber LED indicates Ethernet activity, green LED indicates Ethernet link status
100-240V~2.0A 50/60Hz (rear): (1) Rocker switch, turns main port to unit on or off

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Power

Main Power: 2 Amps @ 100-240 Volts AC, 50/60 Hz
Power Consumption: 40 Watts typical, 20 Watts idle
Power over HDBaseT: IEEE 802.3at PoE+ compliant PSE (Power Sourcing Equipment), supplies up to 25.5 Watts (Class 0-4) to power one HDBaseT PoE or PoE+ PD (Powered Device)

Environmental

Temperature: 32° to 104° F (0° to 40° C)
Humidity: 10% to 90% RH (non-condensing)
Heat Dissipation: 137 BTU/hr typical, 68 BTU/hr idle

Enclosure

Chassis: Metal, black finish, vented sides
Front Panel: Metal, black finish with polycarbonate label overlay
Mounting: Freestanding or 1 RU 19-inch rack-mountable (adhesive feet and rack ears included)

Dimensions

Height: 1.75 in (45 mm)
Width: 18.97 in (482 mm), 17.29 in (439 mm) without rack ears
Depth: 11.19 in (285 mm)

Weight

6.2 lb (2.9 kg)

HDBaseT & DM 8G+ Maximum Cable Lengths

<table>
<tr><th>Cable Type:

Resolution:</th><th>DM-CBL-ULTRA
DM® Ultra
Cable</th><th>DM-CBL-8G
DM 8G®
Cable</th><th>CAT5e
(or better) [2]</th></tr>
<tr><td>1080p60 Full HD</td><td rowspan="8">330 ft
(100 m)</td><td rowspan="4">330 ft
(100 m)</td><td rowspan="4">330 ft
(100 m)</td></tr>
<tr><td>1920x1200 WUXGA</td></tr>
<tr><td>1600x1200 UXGA</td></tr>
<tr><td>2048x1080 DCI 2K</td></tr>
<tr><td>2560x1440 WQHD</td><td rowspan="4">230 ft
(70 m)</td><td rowspan="4">165 ft
(50 m)</td></tr>
<tr><td>2560x1600 WQXGA</td></tr>
<tr><td>3840x2160 4K UHD</td></tr>
<tr><td>4096x2160 DCI 4K</td></tr>
</table>

MODEL & ACCESSORIES

Model

HD-WP-4K-401-C: 4K Multi-Window Video Processor with HDBaseT® & HDMI® Outputs

Accessories

For a list of accessories, visit the HD-WP-4K-401-C product page.

Notes:

1. Inputs 1 and 2 allow sources with resolutions up to DCI 4K to be displayed at their full resolution when in full screen mode (as long as that resolution is supported by the display device). Inputs 3 and 4 will accept sources with resolution up to DCI 4K, however the full screen output resolution for these inputs is limited to 1080p. Sources with resolutions beyond 1080p that are connected to Inputs 3 and 4 are always downscaled to 1080p. Refer to the specifications for additional details on supported input and output resolutions.
2. The maximum cable length for HDBaseT or DM 8G+ is dependent upon the type of cable, resolution of the video signal, and capabilities of each connected device. Refer to the "HDBaseT & DM 8G+ Maximum Cable Lengths" table for a detailed overview. Shielded cable and connectors are recommended to safeguard against unpredictable environmental electrical noise which may impact performance at resolutions above 1080p. Refer to the Crestron DigitalMedia Design Guide, Doc. #4546 for DM system design guidelines. All wire and cables are sold separately.
3. Audio is passed to the output only when displaying an input in full screen or PIP mode. If multiple windows are displayed, controls are available to select the desired audio source.
4. The analog audio output is only active when the input source is outputting a 2-channel stereo signal.
5. When used without a control system, the COM (RS-232) and IR ports support basic on/off power control of a single display device. The addition of a Crestron control system with custom programming enables both the COM and IR ports to be utilized for fully customizable control applications.
6. When used without a control system, CEC may be utilized at either video output to provide basic on/off power control of a single display device. The addition of a Crestron control system with custom programming enables CEC to be utilized through any HDMI or HDBaseT port for fully customizable control applications.
7. The HD-WP-4K-401-C does not provide direct control of a DM receiver or any devices connected to that receiver. To enable this requires a Crestron control system with custom programming.
8. The HD-WP-4K-401-C does not support interlaced input or output signals. An HD-SCALER-HD-E may be added to any HDMI input to enable support for interlaced video sources on that input. Please refer to the HD-SCALER-HD-E spec sheet for more information.
9. HDMI connections require an appropriate adapter or interface cable to accommodate a DVI or Dual-Mode DisplayPort signal. CBL-HD-DVI interface cables are available separately.
10. Deep Color input signals are truncated to 24-bit (8-bits per color) at the output.

This product may be purchased from an authorized Crestron dealer. To find a dealer, please contact the Crestron sales representative for your area. A list of sales representatives is available online at www.crestron.com/salesreps or by calling 800-237-2041.

The specific patents that cover Crestron products are listed online at: patents.crestron.com.

Certain Crestron products contain open source software. For specific information, please visit www.crestron.com/opensource.

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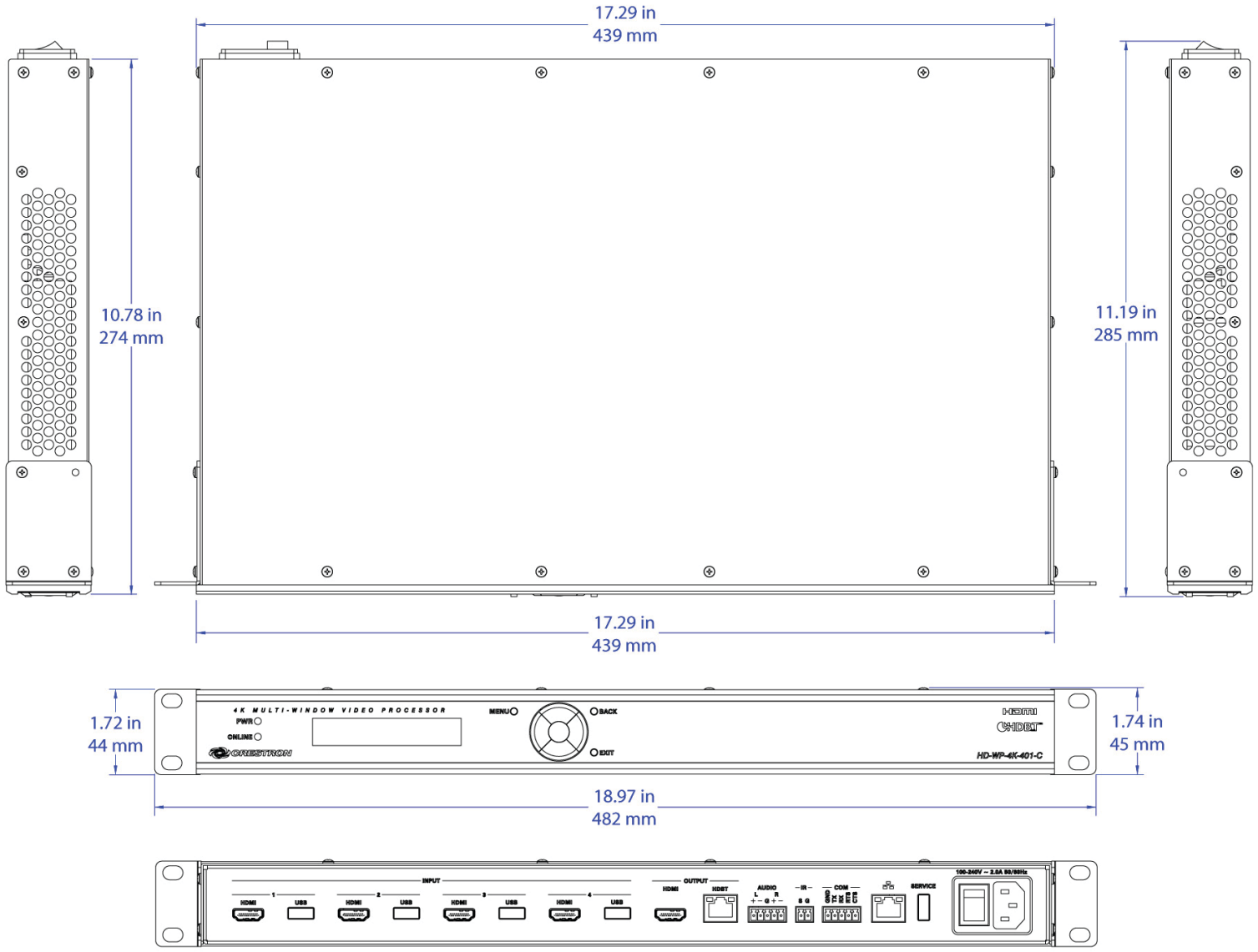

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