Specifications

Video	*Gain*	*... Unity (0.7V), 15% with 3dB peaking (0.9V), 30% with ... 6dB peaking (0.9V)*
	Bandwidth	*... 300 MHz (-3dB)*
Video input	*Number/signal type*	*... 1 analog RGBHV, RGBS, RGsB*
	Connectors	*... 1 9-pin male for MBC cable or buffer*
	Nominal level(s)	*... Analog — 0.3V to 1.45V p-p*
	Impedance	*... 75 ohms or Hi Z, switchable*
	Horizontal frequen	*15 kHz to 150 kHz (optimum 15 kHz to 62 kHz)*
	Vertical frequency	*... 30 Hz to 170 Hz*
Video output	*Number/signal type*	*... 1 analog RGBHV, RGBS, RGsB*
	Connectors	*... 6 BNC female*
	Nominal level	*... Analog 0.7V p-p, 0.8V p-p, or 0.9V p-p w/ peaking*
	Impedance	*... 75 ohms*
	Return loss	*... -30dB @ 5 MHz*
Sync	*Input type*	*... Autodetect RGBHV, RGBS, RGsB (accepts RGsB but does not strip sync from video)*
	Output type	*... RGBHV at all times, RGBS at all times, RGsB only when input is RGsB*
	Input level	*... 2V p-p to 5.5V p-p with ±0.2VDC offset max.*
	Output level	*... 4V to 5V p-p*
	Input impedance	*... 10 kohms*
	Output impedance	*... 75 ohms*
	Max. propagation delay	*... 50 nS*
	Max. rise/fall time	*... 2.5 nS*
	Polarity	*... Positive or negative*
Audio	*Gain*	*... Unbalanced 0dB, balanced +6dB*
	Frequency response	*... ±0.05dB @ 20 Hz to 20 kHz*
	THD + Noi	*0.03% @ 1 kHz, 0.3% @ 20 kHz at rated max. output*
	S/N	*... >90dB, output 14dBu, balanced*
	Stereo channel separation	*... >95dB @ 1 kHz to 20 kHz*
Audio input	*Number/type*	*... 1 stereo, unbalanced; 1Vrms (+4dBu), 20 Hz to 20 kHz*
	Connectors	*... 1 3.5 mm stereo jack (2 channel), unbalanced; tip (R), ... ring (L), sleeve (ground)*
	Impedance	*... 10 kohms, DC coupled*
	Min/max levels	*... 100mV / +8.5 dBu*
Audio output	*Number/type*	*... 1 buffered, stereo (2 channel), balanced or unbalanced*
	Connectors	*... 1 3.5 mm captive screw connector, 5 pole*
	Impedance	*... 50 ohms unbalanced, 100 ohms balanced*
	Gain error	*... ±0.1dB channel to channel*
	Drive (600 ohm)	*... > +14dBu, balanced at stated %THD+N*
General	*Power*	*... 12 to 24VAC or VDC, 0.5 A, 5 watts, external (Order ... the power supply separately, part number 70-055-01.)*
	MBC power jack	*... 9VDC, 0.15 A*
	Temperature/humidity (non condensing)	*... Storage -40° to +158°F (-40° to +70° C) / 10% to 90% ... Operating +32° to +122°F (0° to +50° C) / 10% to 90%*
	Metal enclosure dimensions	*... 1.0" H x 5.7" W x 4.5" D (7" W with mounting brackets) ... 2.54 cm H x 14.48 cm W x 11.43 cm D (17.7 cm W)*
	Shipping weight	*... 2 lbs. (0.9 kg)*
	Vibration	*... NSTA 1A in carton (National Safe Transit Association)*
	Approvals	*... UL, CE, FCC Class A*
	MTBF	*... 30,000 hours*
	Warranty	*... 3 years parts and labor*

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Extron® Electronics

INTERFACING, SWITCHING AND DISTRIBUTION

User's Guide

RGB 440 Interface

Computer Video and Audio

68-378-01 **Rev. E**
Printed in the USA
01 02

The Extron RGB 440 is a 300 MHz universal analog computer-video and audio interface designed to connect workstations and PCs to large screen display/audio systems. With an Extron MBC (monitor break-out cable) or an MBC buffer, the computer's local monitor may be used while the RGB/BNC output goes to a large screen. Analog input can be from VGA, Mac, XGA, XGA-2, Quadra, Sun, SGI, or another source. Contact Extron for information regarding specific computer cabling needs.

The RGB 440 may be mounted under, or on the side, of a table or desk using the included Under Desk Mounting Kit, as shown in figure 1 and as detailed in the kit's documentation (68-461-01). Drill four pilot holes: front-to-back, 2.5" apart, and side-to-side, 6.45" apart.

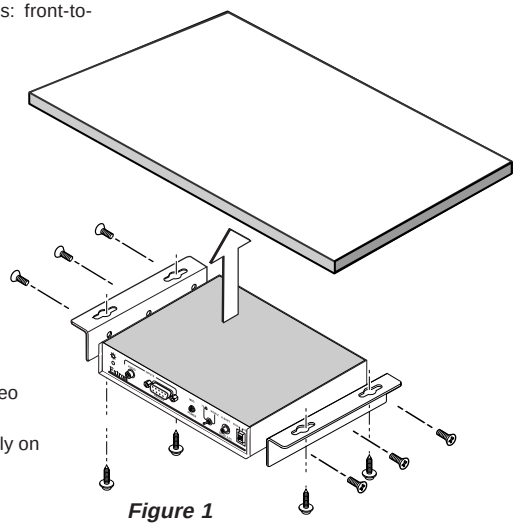


Figure 1

Descriptions of front and rear panel LEDs, controls and connectors follow. The letters to the left of the descriptions match the circled letters in figure 2 below.

A. **Power LED - On** = power and video sync pulses are present.

B. **Audio input connector** - 3.5 mm, stereo jack (tip = L, ring = R, sleeve = ground).

C. **Analog video input connector** - Input connector for MBC buffer, LBC, or MBC cable from computer.

D. **MBC Power output connector** - Provides power for MBC buffer if required.

E. **Termination switch** - Provides 75 ohms video input termination if no local monitor is used.

F. **H-Shift control** - Shifts the image horizontally on remote display device.

G. **Sync processing DIP switches**

Serr = Serration pulses enabled when up.

DDSP = Digital Display Sync Processing enabled when up.

H. **Power input connector** - The input voltage range is 12 to 24 volts AC or DC.

I. **RGB** BNC output connectors

J. **Sync** BNC output connectors

K. **Audio** output connector

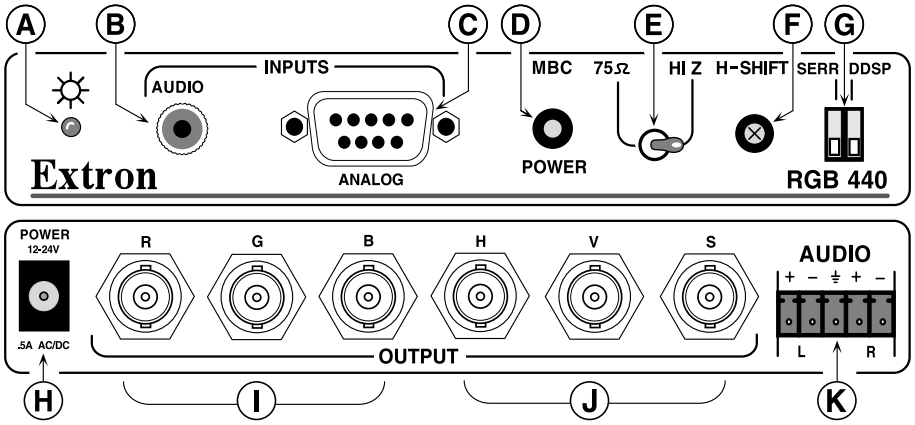


Figure 2

Sync processing switches

Video projectors of different types or from different manufacturers may have slightly different sync pulse requirements. Sync processing DIP switches on the RGB 440 front panel (G) enable the user to modify output sync by enabling or disabling vertical sync serration pulses and enabling or disabling Digital Display Sync Processing (DDSP). The Sync processing switch module contains two DIP switches labeled SERR (left switch) and DDSP (right switch). The Serr switch in the up position (enabled) will result in the removal of serration pulses from the output composite sync signal (does not affect SOG, H or V outputs). The DDSP switch in the up position (enabled) provides Digital Display Sync Processing, which may be required for digital display devices which exhibit an unstable display. With DDSP enabled, the H Shift control (F) on the front panel is defeated.

Jumpers

RGB analog signals passing through coax cables may experience signal loss depending on the quality and length of the cable. The signal loss occurs across all frequencies but primarily higher frequencies. Boost/peaking jumpers located inside the RGB 440 (figure 3) provide a way to compensate for these losses.

CAUTION *Disconnect power before opening the RGB 440.*

To open the RGB 440, remove the mounting brackets (if attached), remove six screws on the sides (if not removed with the mounting brackets), one screw on the bottom, and two connector nuts as shown in figure 3. There is one jumper header for each of the RGB color signals, J8 = red, J9 = green and J10 = blue. Each header provides three possible jumper positions: unity gain (0.7V p-p), 0.8V p-p and 0.9V p-p.

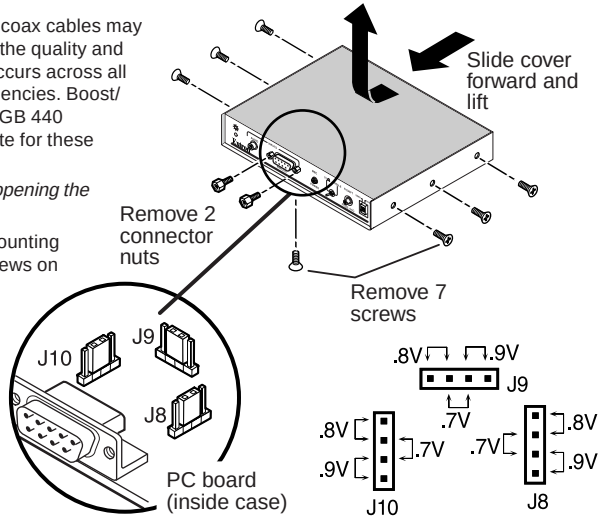


Figure 3

Cable quality/length along with video signal frequencies will have a big impact on the jumper settings. Set up the jumpers just prior to securing the RGB 440 in place.

Jumper position guidelines

0.7V - Short cable runs

0.8V - Long cable runs, signal gain & peaking for all frequencies

0.9V - Long cable runs & high frequency video signals
High frequency signal boost and peaking compensates for high frequency signal loss due to cable capacitance and bandwidth loss.

Using the captive screw audio output connector

The RGB 440 Interface has a single 3.5 mm, captive screw receptacle along the bottom right side of the rear panel ((K) on figure 2). The audio receptacle has five contacts, and is labeled for left (L), right (R), polarity (+/–), and ground.

A 3.5 mm captive screw connector (part number 10-319-10) is supplied with the RGB 440. The connector must be wired to the output audio cables using the captive screws inside the connectors (figure 4A). The audio connector is then plugged into the output connector on the rear panel. Figure 4C shows three methods of wiring the output connector.

When making connections for the RGB 440 Interface from existing audio cables, see figure 4B. The round audio connectors are shown with the top one (tip and sleeve only) for unbalanced audio and the bottom one (tip, ring, and sleeve) for balanced audio. The ring, tip and sleeve markings are also used on the captive screw connector diagrams in figure 4C. Use these examples as a guide for making audio cables.

Figure 4A

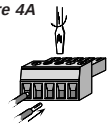


Figure 4B

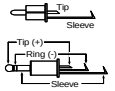
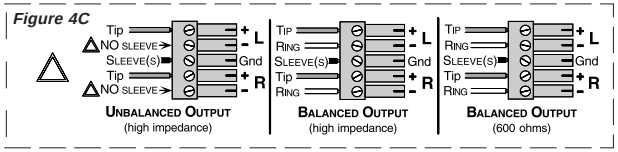


Figure 4C



△ — *NO SLEEVE means NO CONNECTION. Wiring errors or plugging the audio connectors incorrectly may damage the audio output circuits.*

Installation of the RGB 440 using an MBC cable or an MBC buffer

For the following steps, use the diagram in figure 5A or 5B, whichever applies to your installation.

1. Turn off the computer and its monitor.
2. If desired, attach mounting brackets (Extron part #70-077-01, under-desk, or 70-077-02, through-desk).
3. Disconnect the local monitor cable from the computer and connect it to (A).
4. Connect the 9-pin connector from the MBC/MBC buffer to “Analog” on the RGB 440 (B). For an MBC buffer, connect the small plug at the same end of the cable to "MBC Power" on the RGB 440.
5. Connect the remaining MBC/MBC buffer connector to the computer's video output connector (C).
6. Connect the PC audio output cable to the RGB 440 Audio input connector (D).
7. Connect the RGB 440 video output to the output device (E).
8. Connect the RGB 440 audio output to the audio output device (F).
9. Apply power to the RGB 440, the CPU and its monitor, and the output devices.

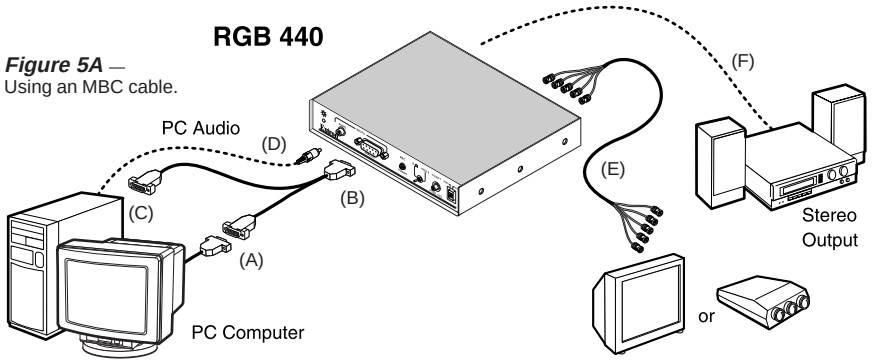


Figure 5A — Using an MBC cable.

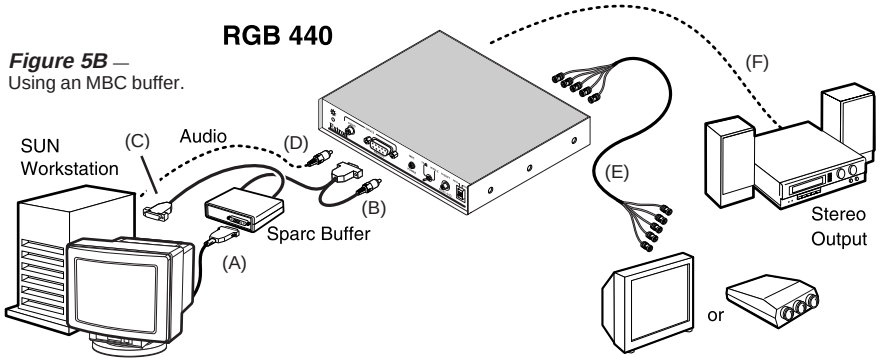


Figure 5B — Using an MBC buffer.

DIP switches

Video projectors of different types or from different manufacturers may have slightly different sync pulse requirements. DIP switches on the RGB 440 front panel enable the user to modify output sync (except SOG) by enabling or disabling vertical sync serration pulses and enabling or disabling Digital Display Sync Processing (DDSP).

The front panel slide switches are shown in figure 6. The Serr switch, when on (up position), will result in the removal of serration pulses from the output composite sync signal. The DDSP switch, when on (up position), provides Digital Display Sync Processing, which may be required for digital display devices which exhibit an unstable display. The H Shift control is disabled when the DDSP switch is in the on position.

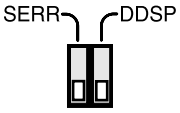


Figure 6

Shield connections

If shielded, twisted pair wire such as that in Extron's Plenum Installation Cable (figure 8) is being used with the RGB 440 captive screw connector, the shields should be connected to connector pin 3 (the center pin) as shown in figure 7. The wires that make up the braid shield (see figure 8) should be separated and twisted together forming a large multi-strand wire, which is then inserted into the receptacle side of the connector. Unused shielded, twisted pair wire must be insulated and secured to prevent short circuits.

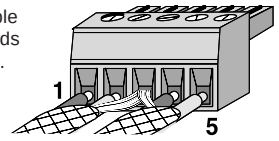


Figure 7

The coax within the Plenum Installation Cable also contains a braid and foil shield which are normally connected to ground through their individual connectors (BNC, RCA, etc.).

CAUTION *Exposed cable shields (braid, foil, etc.) are potential short circuits. Trim back and/or insulate shields with electrical tape or heat shrink.*

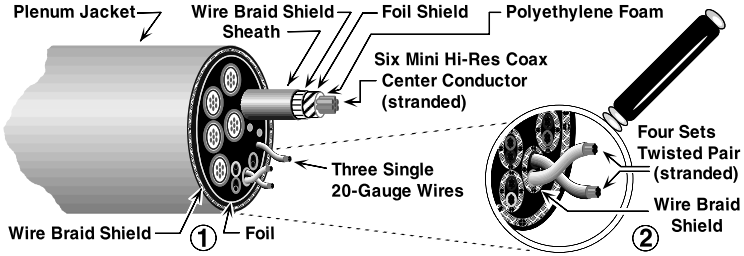


Figure 8 — Extron's Plenum Installation Cable

Power

The RGB 440 requires an external voltage source of 12 to 24 volts AC or DC (500 mA max). Polarity is not an issue, even if the power source is a DC voltage. Simply insert the power plug into the connector labeled POWER ((H) on figure 2) on the rear panel of the RGB 440. An optional 12 VDC external power supply is available from Extron (Part #70-055-01). A power plug (included with RGB 440) must be soldered to the power source wires. The procedure follows:

CAUTION *DO NOT connect the power plug/RGB 440 to a power source greater than 24 volts AC or DC. To do so could cause serious damage to Extron equipment and/or User’s equipment.*

To connect the power plug to the wires from the power source, see figure 9 and do the following:

1. Unscrew the black plastic cover from the plug.
2. Insert the wires from the power source through the tapered end of the black plastic cover.
3. Solder one wire to terminal 1, and the other wire to terminal 2.
4. Before plugging the power plug into the RGB 440, apply power to the voltage source and, using a voltmeter, verify that the voltage at the plug is in the range of 12 to 24 volts AC or DC.
5. Reinstall the plastic cover on the plug and insert the plug into the RGB 440 power connector.

NOTE *The front panel POWER LED is on only when power and video sync pulses are present.*

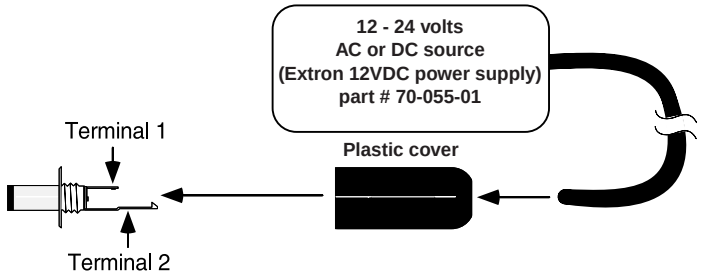



Figure 9