



User's Manual



RGB 302/304

Universal Digital Interface

Chapter One • Introduction to the RGB 302/304

RGB 302/304 Features	1-1
SmartSave™	1-2
LCD Menu Driven Controls	1-2
Memory Blocks and Memory Cycling	1-2
Level Control (picture)	1-2
Peaking Control (sharpness)	1-3
Horizontal Shift Control (centering)	1-3
Vertical Shift Control (centering)	1-3
Automatic Sync Output Detection	1-3
Automatic Sync Stripping	1-3
Keyboard Lockout	1-3
Auto-switching Power Supply	1-3
Audio Interface	1-3
DIP Switch Settings	1-4
RS-232 Control Interface for Remote Control	1-4
Benefits of Windows RGB 302/304 Software	1-4
Front Panel Controls	1-5
Menu button	1-5
Cursor buttons	1-5
Next button	1-5
LCD Display	1-5
RGB 302/304 Specifications	1-6

Chapter Two • Installing the RGB 302/304

Easy Setup Procedure	2-1
Rear Panel DIP Switch Settings	2-3
Audio Connections	2-3
Installation Check	2-4
Memory Cycling Feature	2-5
Preset Memory Blocks	2-6
Power Supply	2-6
RS-232 Interface Specifications	2-6
Application Diagrams	2-7

Chapter Three • Front Panel Menus

RGB 302/304 Menu Sequence	3-1
Using the Menu System	3-2
Default Cycle Menus	3-3
Default Cycle Hot Keys	3-4
Language Menu	3-4
Keyboard Lock/Unlock Menu	3-5
Digital Display Sync Processing	3-5
Image Controls Menus	3-6
Horizontal Shift Menu	3-6
Vertical Shift Menu	3-6
Level Control Menu	3-7
Peaking Control Menu	3-7

Sync Controls Menus	3-8
Sync Output Menu	3-8
Horizontal Polarity Menu	3-9
Vertical Polarity Menu	3-9
Option Controls Menus	3-10
LCD Backlite Menu	3-10
Memory Cycling Menu	3-10
System Reset Menu	3-10
Confirm Reset Menu	3-11
Exit Menu	3-11
Default Settings on Power Up	3-11
Default Settings on System Reset	3-11

Chapter Four • Using the Windows® Control Program

Installing Windows® Control Software	4-1
Normal Windows Control Panel	4-2
RGB 302/304 Help	4-3

Appendix A • Programmer's Guide


Remote Control Port (RS-232)	A-1
Host-to-RGB 302/304 Instructions	A-2
Simple Commands	A-3
Error Codes	A-4
RGB 302/304-Initiated Messages	A-5


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Legend of Icons


The following icons may be used in this manual:


 _____ *Important information – for example, an action or a step that must be done before proceeding.*

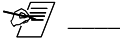
 _____ *A Warning – possible dangerous voltage present.*

 _____ *A Warning – possible damage could occur.*

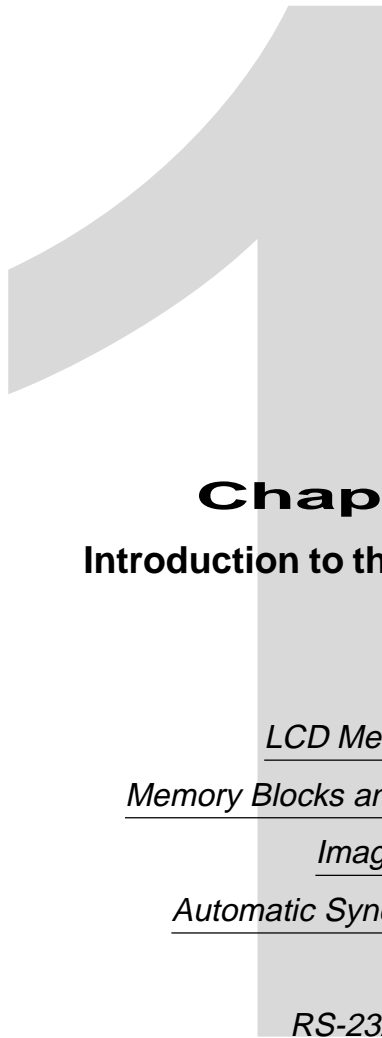
 _____ *A Note, a Hint, or a Tip that may be helpful.*

 _____ *Possible Electrostatic Discharge (ESD) damage could result from touching electronic components.*

 _____ *Indicates word definitions. Additional information may be referenced in another section, or in another document.*



A series of horizontal lines for writing notes, starting below the icon and extending down the page.



Chapter One

Introduction to the RGB 302/304

SmartSave™

LCD Menu Driven Controls

Memory Blocks and Memory Cycling

Image Display Controls

Automatic Sync Output Detection

Keyboard Lockout

RS-232 Control Interface

Front Panel Controls

Specifications

The Extron RGB 302/304 is a digitally controlled Universal Analog/ECL Computer-Video Interface. It can connect most computers to a video presentation device, such as a large screen projector or data monitor. The RGB 302/304's SmartSave™ feature automatically selects sync settings and other parameters for a quick and easy setup.

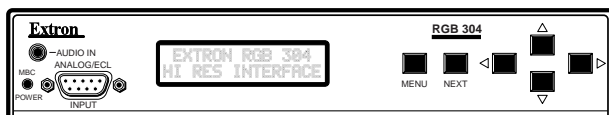
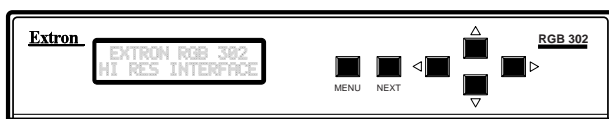
Among the RGB 302/304 features are RGB input/output connectors, an MBC power jack, audio input/output connectors, an RS-232 connector, and rear panel DIP switches.

The RGB 304 is identical in performance and features as the RGB 302 with the exception being that, unlike the RGB 302, the RGB 304 has its 9-pin Analog/ECL input, Audio input, and MBC power jack located on the front panel of the unit, as shown below. This difference allows the RGB 304 to be installed in situations where front panel access to such connectors may be necessary, such as the mounting of the unit in a rack mount environment.

RGB 302/304 Features

The RGB 302/304 features allow video output to be controlled in several ways:

- Automatic sync output detection and setup for quick installation
- Custom setup and adjustments made from the Front Panel (shown below)
- RGB 302/304 Windows® software, through an RS-232 interface
- User-written programs through the RS-232 port



SmartSave™

This unique feature greatly simplifies the video configuration setup of the RGB 302/304. The RGB 302/304 comes preset with various video configurations to match most computer video requirements. The proper configuration is automatically selected and implemented for the user. In addition, the RGB 302/304 will automatically save any user modifications to the video configuration and will recall the correct configuration without need for user intervention.

LCD Menu Driven Controls

The RGB 302/304 does not have front panel “knobs” or “switches” to control its operation. Instead, the “controls” are displayed and adjusted using the Front Panel LCD display and the six front panel buttons.

The Front Panel display can be used in any of four languages: English, French, Spanish and German. The display serves two purposes:

1. The RGB 302/304 automatically detects and displays vital troubleshooting information, such as the horizontal and vertical scan frequencies.
2. The user can step through and display any of the controls or features in the interface.



— Chapter 3 has details on using the Front Panel.

Memory Blocks and Memory Cycling

There are 15 preset memory blocks which store video format information, such as video, sync and control settings. Each block is preloaded by Extron and defines one video configuration (e.g. VESA3, MAC16", etc.). These preset memory blocks define most video requirements. In addition, there are 25 user-definable memory blocks available.

The RGB 302/304 automatically cycles through **(Memory Cycling)** the user-defined memory blocks and loads the video format that most closely matches the computer's video output. Should a match not be found, the 15 preset memory blocks are searched next (refer to the section “Memory Cycling Feature” in Chapter 2).

Level Control (picture)

This feature is similar to the brightness control on a data monitor and is used to adjust the intensity of the video level on the projector/monitor screen by using the cursor keys. There are 255 levels for this control.

Peaking Control (sharpness)

This control is similar to the sharpness control on a data monitor. It is also used to compensate for long cable runs. There are eight Peaking levels which are selected by using the cursor keys.

Horizontal Shift Control (centering)

This feature shifts the displayed image to the left or right on the projector/monitor screen by using the cursor keys. There are 255 positions for this control.

Vertical Shift Control (centering)

This feature shifts the displayed image up or down on the projector/monitor screen by using the cursor keys. There are 255 positions for this control.

Automatic Sync Output Detection

The RGB 302/304 automatically detects which cables are connected and sends either Sync On Green, Composite Sync or Separate Horizontal and Vertical sync signals to the correct output cables. This function can be overridden through menu controls.

Automatic Sync Stripping

The RGB 302/304 automatically strips all incoming sync from the red, green, and blue channels for clean, crisp signal processing. Sync may be recombined with the green channel if necessary.

Keyboard Lockout

The RGB 302/304 features a Keyboard Lockout function which allows the user to "lock out" the front panel controls by using "hot keys". This feature disables front panel operation after setup.

Auto-switching Power Supply

The RGB 302/304 is equipped with an internal auto-switching power supply that operates from any input voltage in the 100 to 240 VAC, 50/60 Hz range. No equipment changes are necessary.

Audio Interface

The RGB 302/304 includes a PC/computer audio (600 ohm) to line-level audio (balanced) converter. For computers which have a sound card, the audio interface will process the audio signal along with the video (audio follow). The audio output can be connected to an external stereo system.

DIP Switch Settings

The RGB 302/304 includes a rear panel DIP switch bank which will activate Digital Display Sync Processing, remove/pass serration pulses, and set 75 Ohm/high impedance video input termination.

RS-232 Control Interface for Remote Control



The RGB 302/304 has a built-in RS-232 interface to allow the unit to be controlled remotely in either of two ways:

1. Use the Windows® RGB 302/304 Control Panel software provided by Extron (see next section).
2. The user may write software to control the RGB 302/304 from a PC or control system. See the **Programmer's Guide** in Appendix A.

The RS-232 protocol is fixed at 9600 baud, no parity, 8 data bits and 1 stop bit.

Benefits of Windows® RGB 302/304 Software

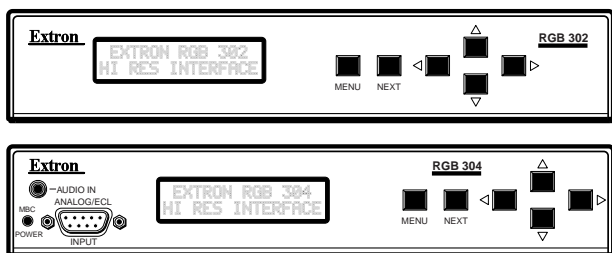
Using the Windows® software provided with the RGB 302/304 adds several advantages over Front Panel operation.

- All of the controls are quick and easy to use with the on-screen control panel.
- Application setups can be stored as disk files, therefore, an unlimited number of setups can be stored and reloaded from the PC's hard drive or floppy disk.

Refer to Chapter 4 for details on using this software.

Front Panel Controls

The Front Panel buttons (as shown below) have many functions, depending on which menu is accessed at any particular time. For example, the user can display and adjust controls to modify the video display. The specific functions for these buttons are described below.



The LCD panel cycles through 3 default menus when the RGB 302/304 is first powered on. Refer to Chapter 3 for instructions on using the RGB 302/304 menus.



— There is a built-in **time-out** function which will return to the default menu cycle if no buttons are pressed for approximately **8** seconds. By default, any changes which were made will be automatically **saved** upon the time-out.

Menu button



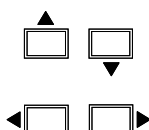
The **Menu** button is used to select and step through the four different menu classes (to be explained in Chapter 3).

Next button



The **Next** button is used to advance to the next submenu of a menu class or to return to the beginning of the menu class (see the menu flowchart on page 3-1).

Cursor buttons



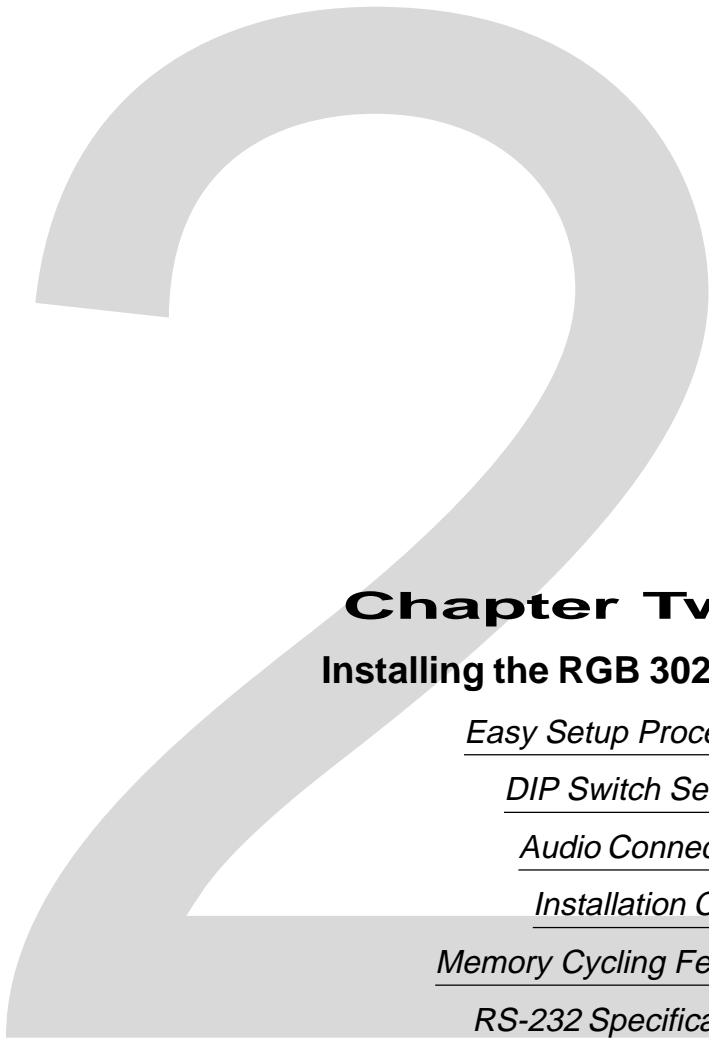
The cursor buttons are typically used to step through the menu options before making a choice. These options could be alpha characters or numeric settings. The user may also want to change the value of the current setting (i.e., increase or decrease level, shift, peaking, etc.). These buttons also serve as convenient “hot keys” to various functions.

LCD Display

Besides displaying the menus, the LCD display provides some helpful information, such as which buttons to use when making choices.

RGB 302/304 Specifications

Part Number	.. 60-243-01 (RGB 302) .. 60-244-01 (RGB 304)
User's Manual	.. 68-354-01
Dimensions	.. 8.75" W x 9.5" D x 1.75" H
Shipping Weight	.. 5 lbs
Input Power	.. 100 - 240 VAC, 50/60 Hz, auto-switchable, internal
Power Consumption	.. 17 watts
Operating Temperature	.. 0° C to 50° C
Control Baud Rate	.. 9600 baud
Input Signal:	
	Video .. 2V p-p max
Video Impedance	.. 75 Ω terminated, 7.5 k Ω untermin.
Sync	.. Separate H & V Sync TTL (\pm) .. Composite H & V TTL (\pm) .. Sync on Green (-).3V .. Sync on Red, Green & Blue (-).3V
Sync Impedance	.. 10 k Ω
Audio	.. Connector: 3.5 mm jack
Audio Impedance	.. High Z
Output Signal:	
Video	.. .35V to 1V p-p with .7V applied
Video Impedance	.. 75 Ω
Sync	.. Sync on Green (-) .. Composite Sync (-) .. Separate H & V (\pm)
Sync Impedance	.. 75 k Ω
Audio	.. Connector: 3.5 mm jack
Audio Impedance	.. 600 Ω
Frequency Compatability:	
Horizontal	.. 15 - 125 kHz (automatically)
Vertical	.. 30 - 170 Hz (automatically)
RGB Video Bandwidth	.. 220 MHz (2 ns rise time)
LCD Scan Rate Range:	
Horizontal	.. 15 - 150 kHz
Vertical	.. 30 - 170 Hz
LCD Menu (Front Panel):	.. Back-lit alphanumeric display (English, German, Spanish or French)
Warranty	.. Two years, parts and labor



Chapter Two

Installing the RGB 302/304

Easy Setup Procedure

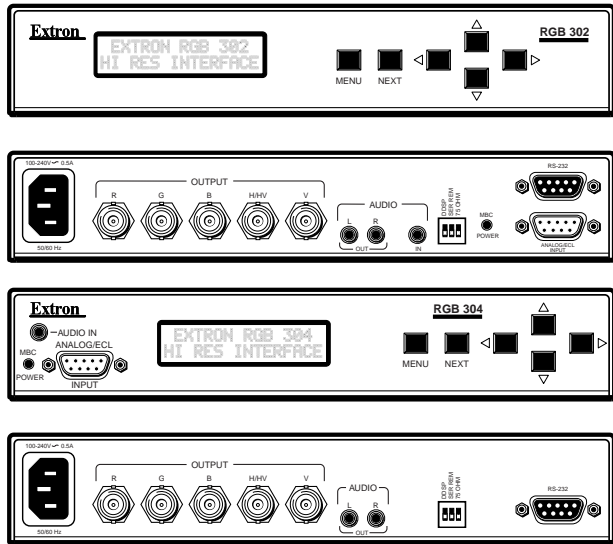
DIP Switch Settings

Audio Connections

Installation Check

Memory Cycling Feature

RS-232 Specifications



The diagrams above show the front and rear panels of the RGB 302 (top pair) and RGB 304 (bottom pair).

Easy Setup Procedure

These easy-to-follow steps describe the general setup of the RGB 302/304. Refer to the example *Application Diagrams* at the end of this chapter.

1. Turn the computer and monitor power **Off**.
Do not connect the RGB 302/304 power cable yet (there is no power switch).
2. Disconnect and remove the computer's local monitor video cable from the computer video port.
3. Connect BNC output cables from the RGB 302/304 to the data monitor/projector — all BNC outputs are RGB analog. The BNC connectors are marked R, B, G, H/V and V. They may be connected in any of three ways:
 - Red, Green/sync and Blue, for RGB with sync on Green. (3-cable hookup)
 - Red, Green, Blue and H/HV, for RGB with Composite sync signals. (4-cable hookup)
 - Red, Green, Blue, H/HV and V, for RGB with separate Horizontal and Vertical sync signals. (5-cable hookup)



_____ The Extron RGB 302/304 automatically detects which cables are connected and sends sync signals to the correct output.



4. Connect the Analog/ECL MBC video cable from the computer (Power PC, PC, Mac, or workstation) to the Analog/ECL Input connector on the RGB 302/304 and to the local monitor. See note below.



_____ If a Laptop Breakout Cable (LBC) is being used, set DIP Switch 3 to **Off**. Refer to “Rear Panel DIP Switch Settings” in the next section.



4a. MBC Power Connector — If an MBC buffer is being used, plug the phone jack into the MBC power female connector of the RGB 302/304.



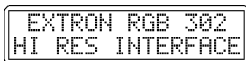
5. RS-232 Control (optional) — If using a PC or other system to control the RGB 302/304, connect the cable here (pinouts and interface specifications are given under the section “Installation Check” later in this chapter).

6. Turn power **On** at the local computer monitor. Next, turn power **On** at the computer supplying the video input — (Power PC, PC, Mac or workstation).

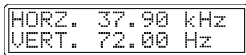
6a. Turn power **On** at the data monitor/projector.

6b. Connect power to the RGB 302/304.

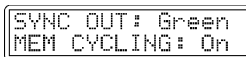
7. Observe that the RGB 302/304 LCD display lights up and cycles through the three default menus (below).



7a. The **ID** or **Title** Menu - Displays the name of the unit. To change this display, see “Editing the ID Screen” in Chapter 3.



7b. The **Scan Rate** Menu - From the monitor breakout cable, the RGB 302/304 detects the scan rate frequencies and displays them. The scan rate display on the left is an example.



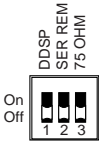
7c. The **Sync Output-Memory Cycling** Menu - As an example, if the RGB 302/304 has detected an output with sync on Green and Memory Cycling is turned On, the first line will display “Sync Out: Green” and the second line will display “Mem Cycling: On” .

Refer to the “Memory Cycling Feature” section in this chapter for a detailed explanation of Memory Cycling.



Memory Cycling can be On or Off. Sync Output can be Green, Comp (Composite), H&V (Separate Horizontal & Vertical), or Auto (Automatic). Automatic Sync means the RGB 302/304 detects which output connectors are currently active and will set and display the output sync as either Green, RGBS or RGBHV, depending on the connections.

Rear Panel DIP Switch Settings



The RGB 302/304 has three DIP switch settings:

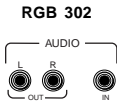
Switch 1: On = Digital Display Sync Processing
Off = Processed sync (normal)

Switch 2: On = Remove serration pulses
Off = Pass serration pulses (normal)

Switch 3: On = 75-Ohm input termination
Off = High impedance input termination

Audio Connections

The RGB 302/304 provides audio interfacing to the audio output which is connected to the user's audio equipment. The user supplies the audio cables.



On the RGB 302, the audio input and output are both located on the rear panel, as shown in the diagram to the left.

The RGB 304 has the audio output located on the rear panel, but the audio input is situated on the front panel, as shown to the right.

RGB 304

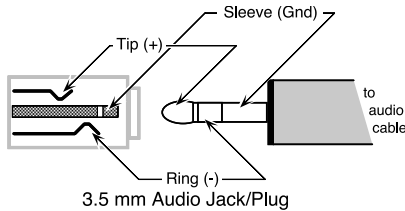


The audio interface is a PC/computer audio (600 Ω) to line-level audio (balanced) converter. If the computer has a sound card, the RGB 302/304 will distribute the audio with the video (audio follow).

Although the input and output audio connectors are physically the same, they are used differently. See the illustration and the following descriptions for the correct wiring of audio inputs and outputs.

Audio Input — Connect the stereo audio sources to **Audio In**. Input cables should be wired as follows:

- Stereo left to Tip (+) contact
- Stereo right to Ring (-) contact
- Both commons to Sleeve (Gnd) contact



Audio Output (Left and Right) — There is one audio output using separate connectors for left and right channels. Connect the left and right output jacks to the inputs of an external audio system. The 3-contact outputs can be wired for balanced or unbalanced audio.

- For unbalanced audio, use Tip (+) and Sleeve (Gnd)
- For balanced audio, use Tip (+) and Ring (-)



— *Observe polarity when making connections to keep left and right channels in phase.*

Installation Check

To verify that the installation is complete, do the following:

1. Check that the LCD default menus show the correct information (as previously described in Step 7). Use the menus as a troubleshooting aid.

```
HORZ. 00.00 kHz
VERT. 00.00 Hz
```

If no video input was detected, no memory block was loaded, and the display will show zeroes.

```
HORZ. 37.90 kHz
VERT. 72.00 Hz
```

The scan rate menu may be used for troubleshooting as follows:

- The timing for the RGB 302/304 is derived from the vertical sync signal. If the vertical sync signal is not present, **both** the vertical and horizontal frequencies will be zeroes, even if there is a horizontal signal present.
- If a vertical sync signal is detected and the horizontal sync is **not** detected, the vertical frequency is displayed, but the horizontal frequency is zeroes.

2. Recheck the previous **Easy Setup Procedure** steps for correct cable connections, etc.

Memory Cycling Feature

The RGB 302/304 is preset at the factory with fifteen video formats which are stored in memory blocks. These memory blocks contain video formats which will match most computers. There are also 25 additional empty memory blocks which are user-defined.

When a video input is connected and the RGB 302/304 is powered On, the 25 user-defined memory blocks are scanned (cycled) sequentially for a configuration which matches the computer's video input. If a match is found, that format's stored settings are implemented. If a match is not found, the 15 preset video formats are scanned next. If a match is found, that format and any adjustments to the image are automatically saved to a user-defined memory block (if Memory Cycling is set On). If a match is not found among the preset formats, a new video format will be created and stored (see note below) as a user-defined memory block.

The 25 user-defined memory blocks are filled sequentially (1 to 25). If the last empty memory block (#25) has already been filled and a new video format is added, memory block #1 will be overwritten. Additional new formats will sequentially overwrite memory blocks #2, #3, #4, etc., and start over again at memory block #1, #2, #3, etc.

The 15 preset memory blocks are permanently stored, while the 25 user-defined memory blocks can only be cleared by resetting the RGB 302/304 (refer to **System Reset Menu** in the "Option Controls Menus" section of Chapter 3). Powering Off the RGB 302/304 will not delete any of the memory blocks.



_____ If Memory Cycling is disabled (set **Off**), any changes to a video configuration will not be stored in a memory block and no new memory blocks will be saved. Refer to **Memory Cycling Menu** in the "Option Controls Menus" section of Chapter 3.

Preset Memory Blocks

The Memory Cycling feature supports 25 user-defined memory blocks for storing video configurations and 15 permanently defined memory blocks. The 15 preset memory block video configurations are listed below.

No.	Format	Horizontal Frequency [kHz]	Vertical Frequency [Hz]
1	VGA1	31.5	70
2	VGA2	31.5	70
3	VGA3	31.5	60
4	VESA1	35.2	56
5	VESA2	37.9	72
6	VESA3	48.4	60
7	VESA4	56.4	70
8	VESA5	38.0	60
9	VESA6	48.0	72
10	Mac 13"	35.0	67
11	Mac 16"	49.7	75
12	Mac 21"	68.7	75
13	Sun1	71.7	76
14	Sun2	81.0	76
15	SGL	63.9	60

Power Supply

The RGB 302/304 is equipped with an internal auto-switching power supply that operates from any input voltage in the 100 to 240 VAC, 50/60 Hz range. No equipment changes are necessary.

RS-232 Interface Specifications

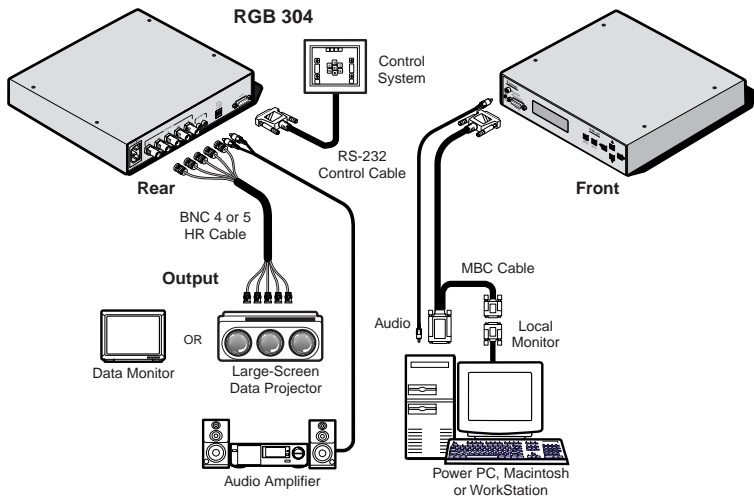
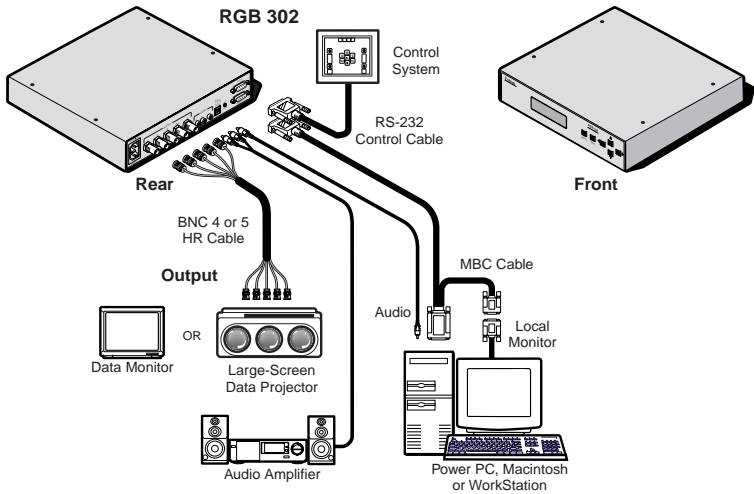
9600 baud, no parity, 8 data bits and 1 stop bit.
RS-232 Connector Pins are assigned as follows:



Pin	Signal	Pin	Signal	Pin	Signal
1	—	4	—	7	—
2	Transmit	5	Ground	8	—
3	Receive	6	—	9	—

Application Diagrams

The diagrams below show possible application setups for the RGB 302 and RGB 304.



Chapter Three

Front Panel Menus

Menu Flowchart

Default Cycle Menus

Image Controls Menus

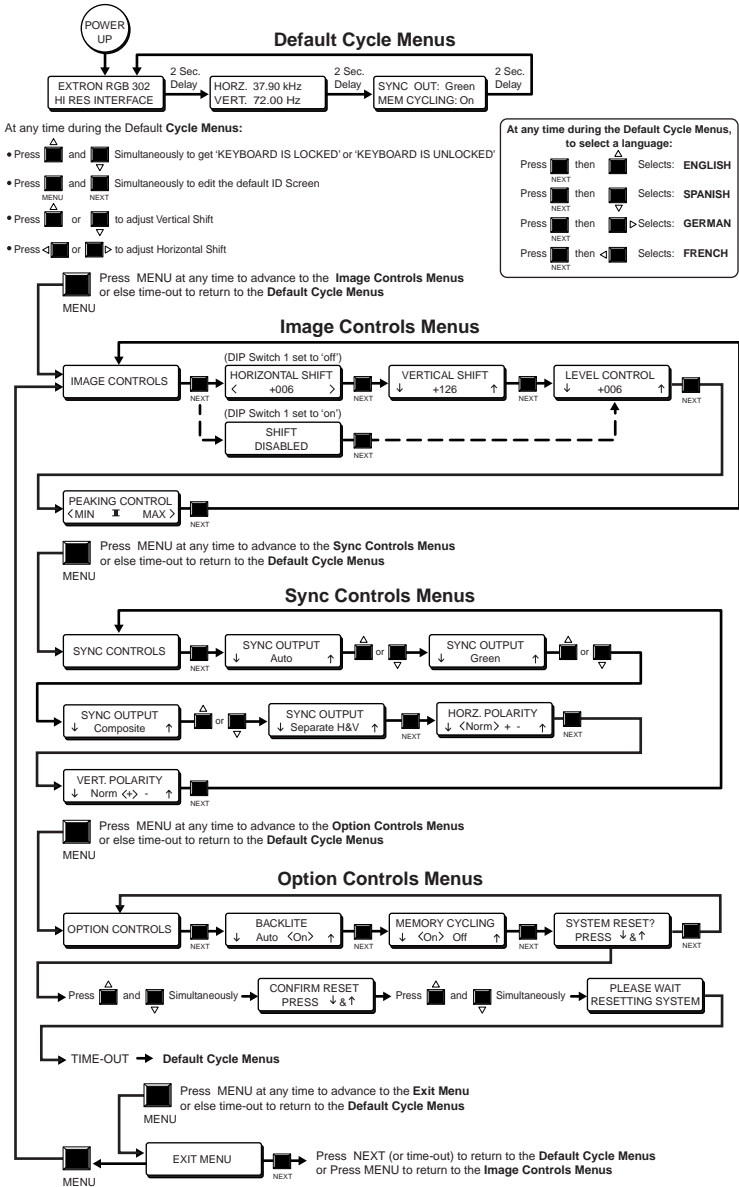
Sync Controls Menus

Option Controls Menus

Default Settings

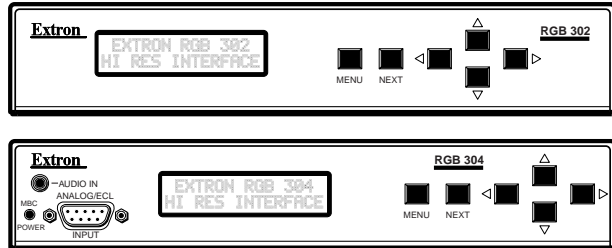
RGB 302/304 Menu Sequence

The flowchart below describes, in top-to-bottom sequence, the four major menu classes of the RGB 302/304: **Default Cycle** menus, **Image Controls** menus, **Sync Controls** menus, and **Option Controls** menus.



Using the Menu System







The RGB 302/304 control menus are accessed through the Front Panel (refer to Chapter 1, “Using the Front Panel”). Use the LCD display, together with front panel keys (see below), to view or make changes to the current settings. Observe the monitor or projector screen while making adjustments. The menu flowchart on page 3-1 may be used as a guide while stepping through the menus.



When using the front panel, a pause (**time-out**) of approximately **8** seconds will release the current menu mode and the RGB 302/304 returns to the 3-menu default cycle and **saves** any changes. If the user powers **off** the RGB 302/304 **before** returning to the default cycle (either by a **time-out** or **Exit Menu**), any new changes will **not** be saved.


When making adjustments using the cursor keys (see below), stop when the proper adjustment has been reached and allow the time-out to occur to save the new settings.

The menu system, as illustrated in the previous menu flowchart, consists of four major classes of menus: **Default Cycle** menus, **Image Controls** menus, **Sync Controls** menus, and **Option Controls** menus. These menus are discussed in detail later in this chapter.

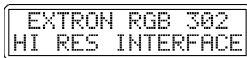
Pressing the **Menu** key () will advance you to the next class of menus as indicated in the flowchart. The **Next** key () is used to step through the submenus or to return to the beginning of the menu class, while the cursor keys (   ) are used to change or select the settings. There are also special keys and key combinations, known as “hot keys”, which are discussed later in this chapter.

Default Cycle Menus

When the RGB 302/304 is initially powered up, the RGB 302/304 is in a 3-menu default cycle. Several options are also accessible from the default menu cycle: a menu interface language, keyboard lock/unlock control, ID screen edit menu, and the image controls menus. The image controls menus, one of the four classes of menus, sets image shifting, level and peaking.

When the RGB 302/304 is first powered up, the LCD displays three default menus for about 2 seconds each. From this default menu cycle, you can advance to the next class of menus, "Image Controls", by pressing  at any time.



This 3-menu default cycle can also be broken by simultaneously pressing the "hot keys" **Next** and **Menu**. This will cause the RGB 302/304 to switch from "default" mode to "menu" mode (see "Editing the ID Screen" below).








EXTRON RGB 302
HI RES INTERFACE

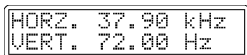
- The **ID Screen** default menu identifies the interface and is factory programmed as shown here. However, this display can be edited to display a user-created message.

Editing the ID Screen —

To access the ID screen at any time from the default cycle, press the "hot keys"  and  simultaneously.

The first character on the ID screen will flash. When entering text, use the  and  keys to scroll through the alphabet and change the character, then press  to go to the next character position, or use  to back up.

After creating the new message, pressing  will return you to the default menu cycle and save any changes. The new information will now display on the ID screen. The default screen can still be restored if the system is reset (see System Reset in the "Option Controls Menus" section of this chapter).



HORZ. 37.90 kHz
VERT. 72.00 Hz

- The **Scan Rate** default menu displays the scan rate frequencies detected from the video input. This menu is for information only and cannot be modified by the user.



- The third default menu displays what type of **Sync Output** has been selected and whether the **Memory Cycling** feature has been turned On or Off. To change any of these menu settings, refer to Sync Output in the “*Sync Controls Menu*” section and refer to Memory Cycling in the “*Option Controls Menu*” section of this chapter.

Default Cycle Hot Keys

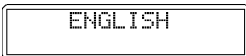
You may choose to “hot key” directly out of the default menu cycle (see note below) by pressing the or key. This will take you directly to the **Horizontal Shift** menu (see Horizontal Shift in the “*Image Controls Menu*” section of this chapter). Similarly, by pressing either the or key, you will go directly to the **Vertical Shift** menu (see Vertical Shift in the “*Image Controls Menu*” section of this chapter).



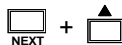
Using these “hot keys” to exit from the default menu cycle will only work if DIP Switch 1, located on the rear panel of the RGB 302/304, has been set **Off**. Setting it to Off means the **Digital Display Sync Processing is not active**, but Normal sync processing **is active**. If Digital Display Sync Processing **is active** (Switch 1 set **On**), the “Shift Disabled” message will display. See “Rear Panel DIP Switch Settings” in Chapter 2 and “Digital Display Sync Processing” later in this chapter.



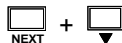
Language Menu



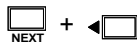
The user may change the menu language (English, Spanish, French or German) by doing the following: while in the default menu cycle, **hold down** the key **first**, then press the cursor key for the desired language (shown below). The default is **English**.



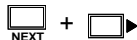
Next and Up for English



Next and Down for Spanish

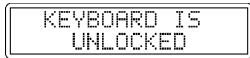
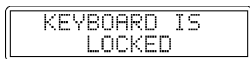




Next and Left for French



Next and Right for German

Keyboard Lock/Unlock Menu

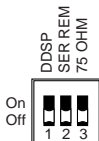


Utilizing the **Keyboard Lock/Unlock** feature allows the user to lock or unlock the front panel controls for security reasons. While in the default menu cycle, depressing the cursor keys  and  simultaneously for 2 seconds will either lock or unlock the front panel controls, depending on the original front panel lock/unlock status.



Once the keyboard is locked it will remain locked even when power to the RGB 302/304 is removed. To alert the user upon power up if the keyboard has been locked, the unit will show the locked message.

Digital Display Sync Processing



Digital Display Sync Processing (DDSP) is a DIP switch option for all three sync output choices and is normally set **Off**. This means that the incoming sync will be processed, shifted, and then sent to the presentation display.

If DIP Switch 1 is set **On**, the sync will pass directly to the presentation display without being processed and the horizontal and vertical shift controls will have no effect on the sync output (the “*Shift Disabled*” message will be displayed).












The following menus require use of the cursor keys to make adjustments or selections. As a matter of convenience (but excluding the use of “hot keys”), pressing either the  or  key will have the same effect. Similarly, pressing either the  or  key will have the same effect.

Image Controls Menus



From the Default Cycle menus, press  to advance to the Image Controls menus. The image which the RGB 302/304 displays on a monitor or projector screen can be adjusted through these menus. Press  to go to the Horizontal Shift menu (see note below) or  to advance to the Sync Controls menus.





If the “Shift Disabled” message is displayed, the unit has been set to the **Digital Display Sync Processing** mode. Refer to “Digital Display Sync Processing” earlier in this chapter.







Horizontal Shift Menu



The **Horizontal Shift** menu moves the displayed image left or right on the monitor/projection screen. From the default cycle, you can go directly to this menu by pressing either the  or  “hot key”. The default setting is “CENTER”.





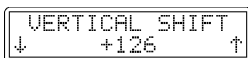
While observing the video screen, use the cursor keys  and  to adjust the horizontal centering. There are 255 incremental steps for this control.



When the adjustment is complete, release the cursor key and press  to go to the Vertical Shift menu, or press  to advance to the Sync Controls menus, or allow the timeout to occur to save any changes.



Vertical Shift Menu



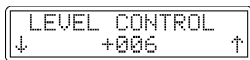
The **Vertical Shift** menu moves the displayed image up and down on the presentation screen. From the default cycle, you can go directly to this menu by pressing either the  or  “hot key”. The default setting is “CENTER”.







While observing the video screen, use the cursor keys  and  to adjust the vertical centering. There are 255 incremental steps for this control.

When the adjustment is complete, release the cursor key and press  to go to the Level Control menu, or press  to advance to the Sync Controls menus, or allow the time-out to occur to save any changes.

Level Control Menu







The **Level Control** menu is similar to the brightness control on a data monitor. Using this menu, the user can change the video level (defaults to "CENTER") using the  cursor key to lower the level or the  key to raise the level. Pressing the key once changes the setting by 001. Holding the key down continuously causes the setting to change faster. There are 255 incremental steps for this control.

When the adjustment is complete, release the cursor key and press  to go to the Peaking Control menu, or press  to advance to the Sync Controls menus, or allow the time-out to occur to save any changes.

Peaking Control Menu





The **Peaking Control** menu provides compensation for losses in signal quality due to cable capacitance. Use this control to adjust the **sharpness** of the picture on the presentation screen. Use the cursor keys  or  to move the indicator to the left or right. Observe the results on the monitor/projection screen while making the adjustment. There are eight possible Peaking settings.

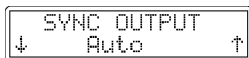
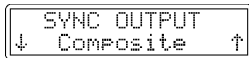
When the adjustment is complete, release the cursor key and press  to return to the Image Controls menus, or press  to advance to the Sync Controls menus, or allow the time-out to occur to save any changes.

Sync Controls Menus






The **Sync Controls** menu consists of the **Sync Output** menus. The Sync Output menu determines how the sync output of the RGB 302/304 is specified. Press  to go to the Sync Output menu, or press  to advance to the Option Controls menus, or allow the time-out to occur.

Sync Output Menu



As shown in the menu flowchart on page 3-1, there are four sets of Sync Output menus, one set for each sync source. The LCD will display one of four sync output menus: **Green**, **Composite**, **Separate H&V** (Separate Horizontal & Vertical), or **Auto** (Automatic Sync) - see note below.

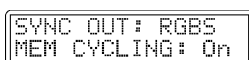
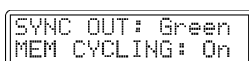
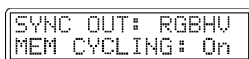
The **Sync Output** menu allows the user to change the sync output. The sync defaults to Automatic sync. However, it can be changed to Composite sync, Separate H & V sync, or Sync on Green by pressing the  or  cursor key. The currently selected sync setting will not flash, but the alternate settings will flash. To select an alternate sync setting, press . After selecting a new sync setting, allow the time-out to occur to save it.



Automatic Sync means the RGB 302/304 detects which terminated* output connectors are currently active and will set the output sync as either Sync on Green, Composite Sync, or Separate H & V, depending upon the connections. If Separate H & V is detected, the Vertical and Horizontal polarities are set to negative (-).

*610 ohms or less impedance

Examples of Default Cycle menus which display sync output and Memory Cycling status are shown below.



```

SYNC OUT:A-Green
MEM CYCLING: On

```

```

SYNC OUT:A-RGBS
MEM CYCLING: On

```

```

SYNC OUT:A-RGBHV
MEM CYCLING: On

```

If sync output is Auto, the possible sync output configurations are: sync on Green (3-cable hookup), Composite sync (4-wire hookup), or Separate H & V (5-wire hookup). See the example Default Cycle sync output menus on the left.





If the sync output specified above was **Separate H & V**, the horizontal and vertical polarities may be changed as described in the next sections.



Horizontal Polarity Menu

```

HORZ. POLARITY
↓ <Norm> + - ↑

```

The **Horz. Polarity** menu allows the user to change the **horizontal polarity** of the sync output. The horizontal polarity is selected by pressing either the  or  or  or  cursor key and choosing either normal <norm>, positive <+>, or negative <->. Normal means output polarity will be the same as input polarity with shifting allowed.





Press  to go to the Vertical Polarity menu, or press  to advance to the Option Controls menus, or allow the time-out to occur to save any changes.



Vertical Polarity Menu

```

VERT. POLARITY
↓ Norm <+> - ↑

```



The **Vertical Polarity** menu allows the user to change the **vertical polarity** of the sync output. The vertical polarity is selected by pressing either the  or  or  or  cursor key and selecting either normal <norm>, positive <+>, or negative <->. Normal means output polarity will be the same as input polarity with shifting allowed.

Press  to return to the Sync Controls menus, or press  to advance to the Option Controls menus, or allow the time-out to occur to save any changes.

Option Controls Menu









Among the menu options for the RGB 302/304 are the **LCD Backlite**, **Memory Cycling**, and **System Reset**.

Press  to go to the Backlite menu, or press  to advance to the Exit Menu, or allow the time-out to occur.

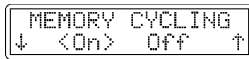
LCD Backlite Menu









The **LCD Backlite** menu allows the user to permanently turn on the LCD backlite <On> or temporarily turn off the backlite <Auto>. The Auto state turns off the backlite whenever there is no activity for 15 seconds. Auto will turn on the backlite whenever any front panel key is pressed.

Press the  or  or  or  key to select between <On> or <Auto>. Then press  to go to the Memory Cycling menu, or press  to return to the Image Controls menus, or allow the time-out to occur to save any changes.

Memory Cycling Menu



The **Memory Cycling** menu allows the user to turn the memory cycling cycling feature On or Off.





Press the  or  or  or  key to select between <On> or <Off>. Then press  to go to the System Reset menu, or press  to return to the Image Controls menus, or allow the time-out to occur to save any changes.

Refer to the “*Memory Cycling Feature*” section in Chapter 2.

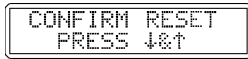

System Reset Menu






The **System Reset** menu allows the user to reset the RGB 302/304 to its factory settings.

Press the  and  keys simultaneously to go to the Confirm Reset menu or press  to return to the Option Controls menu, or press  to return to the Image Controls menu, or allow the time-out to occur.

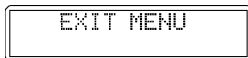
Confirm Reset Menu






The **Confirm Reset** menu actually resets the RGB 302/304 to its factory settings. Press the  and  keys simultaneously to reset or press  to return to the default menu cycle, or allow the time-out to occur. A reset message will be displayed if reset was selected.

By allowing the time-out to occur, you will return to the default menu cycle.

Exit Menu



The **Exit Menu** menu allows the user to return to the Image Controls menus by pressing the  key or the user may return to the default menu cycle by either pressing  or by allowing the time-out to occur.

Default Settings on Power Up

On **power up**, the RGB 302/304 will default to the last settings which were current just prior to the power off. All 25 user-defined memory blocks will be saved if Memory Cycling had been set On.

Default Settings on System Reset

On **system reset**, the RGB 302/304 will have the following default settings:

- Menu language is set to English
- Backlite is set On
- Memory Cycling is set On
- Horizontal Shift is Center
- Vertical Shift is Center
- Level is Center
- Peaking is Minimum
- Sync Output is Automatic

All 25 user-defined memory blocks will be cleared, but the 15 factory preset memory blocks will be retained.

*RGB 302/304 Universal Digital Interface
User's manual*



Chapter Four

Using the Windows® Control Program

Installing the Windows® Control Software

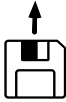
Normal Windows Control Panel

RGB 302/304 Help

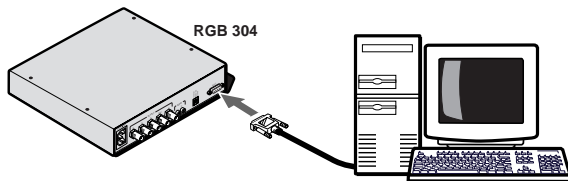
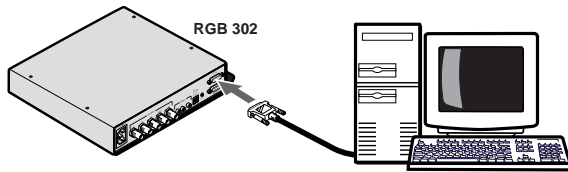
Installing Windows® Control Software

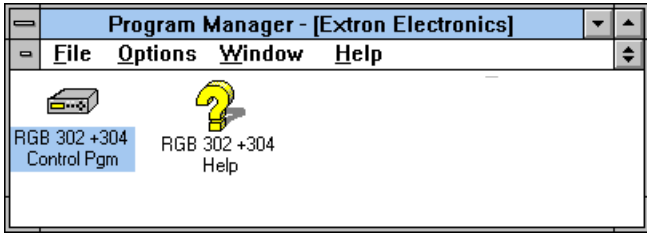
This chapter is dedicated to using Extron's "Windows Control Program for RGB 302/304 via RS-232" software. Extron supplies this software that runs in the Windows® operating system, version 3.1 or later. Communication between the computer software and the RGB 302/304 is established after connecting the computer to the RS-232 Port on the rear panel of the RGB 302/304 (see diagrams below).

1. Connect the PC's Comm port to the RS-232 connector on the back of the RGB 302/304.
2. Power up the RGB 302/304, the PC, and load Windows.
3. To install the software from the 3.5" floppy disk onto the hard disk, run SETUP.EXE from the floppy disk. (It's just like any other Windows application.)



— *The floppy disk has instructions printed on the label.
The software can be run from the floppy drive or loaded onto the hard drive.*



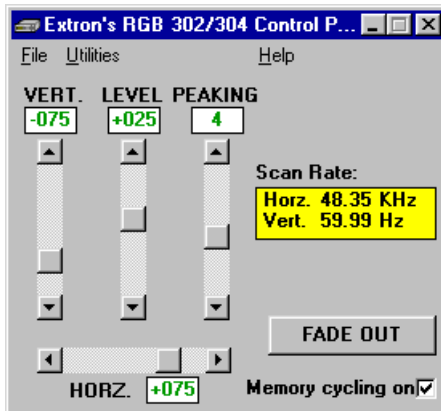


4. Installation of the software creates a Program Group (Windows 3.1) or a Folder (Windows 95®) called "Extron Electronics". Icons for the Control Program and the Help Program are installed in that group or folder. The Window in the above illustration shows an Extron Program Group.
5. Double-click on the RGB 302/304 Control Program icon to start the program. You will be asked to select the Comm Port. After selecting the Comm Port, the software looks for the RGB 302/304, "reads" its configuration, and then displays it in a window called "Extron's RGB 302/304 Interface Control Program".

Normal Windows Control Panel

The following illustration shows an example of the normal Windows control panel. Among the convenient image adjusting features are controls for:

- Vertical Shifting
- Horizontal Shifting
- Level adjustment
- Peaking adjustment
- Scan rate (display only)



RGB 302/304 Help

Double-click on the RGB 302 + 304 Help Icon (or press F1 at any time) to open the Help Window. An example of what this might look like is shown below.

As with all Windows® Help files, clicking on the underlined words will give more detailed help.

RGB 302/304 Main Screen :

For Help on specific utility screens, click the appropriate item below:

- Buttons & Controls of the [Front-Panel Screen](#)
- Buttons & Controls of the [Sync Settings Screen](#)

For Help on specific buttons and controls, click the appropriate item above.
 [Use the Mouse or the TAB/ENTER keys to get details about the selected area of the screen].

Note that pressing **F1** from within the program will provide context-sensitive Help.

*RGB 302/304 Universal Digital Interface
User's manual*



Appendix A
Programmer's Guide

Remote Control Port – RS-232

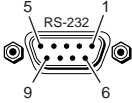
Host-to-RGB 302/304 Instructions

Command/Response Table

RGB 302/304-Initiated Messages

Remote Control Port (RS-232)

The RGB 302/304 RS-232 port connector, shown below, is used to connect to a host or external controlling device, such as a computer or control system which can generate the proper command codes and recognize the RGB 302/304 responses.



The RS-232 connector is a 9-pin D female with the following pin designations:

Pin	RS-232	Usage
1	—	No connection
2	Tx	Transmit Data
3	Rx	Receive Data
4	—	No connection
5	Gnd	Signal Ground
6	—	No connection
7	—	No connection
8	—	No connection
9	—	No connection

Commands and responses for programming the RGB 302/304 Interface from a Host system connected to the RS-232 port are listed on the next page.

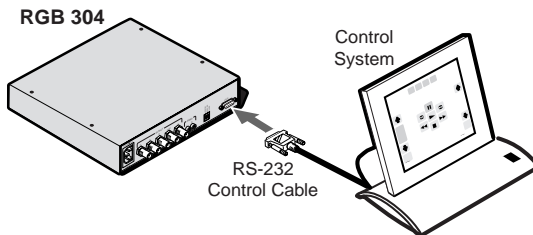
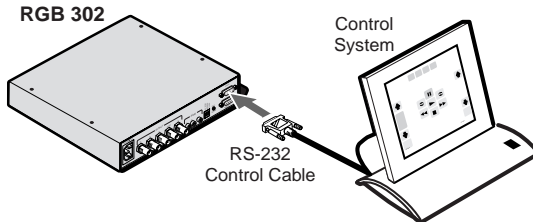
The RS-232 protocol is 9600 baud, 8-bit, 1 stop bit and no parity.

Host-to-RGB 302/304 Instructions

The RGB 302/304 will recognize certain ASCII characters as instructions. It then responds to those characters with appropriate information.

Unrecognizable codes will result in an error code as the response.

Examples of RGB 302/304 RS-232 connections are shown here.



Command/Response Table

Definitions and Abbreviations:

- ↵ = CR/LF (Hex values: 0D 0A)
 - X1 = 1 thru 8 (steps of peaking)
 - X2 = -127 ↔ 0 ↔ +127 (enhancement control range)
 - X3 = Controller software version to 2nd decimal place
 - X4 = xxx.xx (frequency in Hz or kHz)
 - X5 = Menu language (1 = English, 2 = Spanish, 3 = French, 4 = German)
 - X6 = Output sync format where 0 = Automatic*, 1 = Sync on Green, 2 = Composite, 3 = H & V (normal), 4 = H & V (both +), 5 = H & V (+H, -V), 6 = H & V (-H, +V), and 7 = H & V (both -)
- * If executing the I/i command (Request Information) and sync output is set to Automatic (0), then 0 = RGB with sync on Green, 8 = RGB with separate H & V, and 9 = RGB with Composite sync.
- X7 = 0 or 1, 0 = Off, 1 = On

Simple Commands

Commands	ASCII	Hex	Response
<u>Video Level Control</u>			
specify video level	[X2] Y	[X2] + 59	Brn [X2] ↓
increment video level	{ Y	7B + 59	Brn [X2] ↓
decrement video level	} Y	7D + 59	Brn [X2] ↓
<u>Peaking Control</u>			
specify video peaking	[X1] _	[X1] + 5F	Pkg [X1] ↓
increment video peaking	{ _	7B + 5F	Pkg [X1] ↓
decrement video peaking	{ _	7D + 5F	Pkg [X1] ↓
<u>Horizontal Shift</u>			
specify horizontal shift	[X2] H	[X2] + 48	Hph [X2] ↓
increment horizontal shift	{ H	7B + 48	Hph [X2] ↓
decrement horizontal shift	} H	7D + 48	Hph [X2] ↓
<u>Vertical Shift</u>			
specify vertical shift	[X2] /	[X2] + 2F	Vph [X2] ↓
increment vertical shift	{ /	7B + F	Vph [X2] ↓
decrement vertical shift	} /	7D + F	Vph [X2] ↓
<u>Executive Mode</u> (Front Panel Lockout)			
Executive mode on	X	58	Exe 1 ↓
Executive mode off	x	78	Exe 0 ↓
<u>Read DIP Switches</u>			
Read DIP switches	Esc p 00 ↓	1B+70+30+30	00 Dds [X7]• Ser [X7]•Trm [X7] ↓
<u>Write Sync Mode</u>			
	[X6] ` ↓	[X6] + 60	Syn [X6] ↓
<u>Memory Cycling</u>			
Enable	.	2E	Mem 1 ↓
Disable	,	2C	Mem 0 ↓
<u>Backlite Display Mode</u>			
Auto	S	53	Mut 1 ↓
On	s	73	Mut 0 ↓
<u>Write ID Screen</u>			
	Esc P 02 (up to 32 characters) ↓	1B+50+30+32	Updated ↓
<u>Read ID Screen</u>			
	Esc p 02 ↓	1B+70+30+32	02 (up to 32 characters) ↓
<u>Menu Language</u>			
English	# 1	23 + 31	Fnc 1 ↓
Spanish	# 2	23 + 32	Fnc 2 ↓
French	# 3	23 + 33	Fnc 3 ↓
German	# 4	23 + 34	Fnc 4 ↓

Commands	ASCII	Hex	Response
<u>Set Fade To Black</u>			
Fade Screen	B	42	Blk 1 ↵
<u>Clear Fade To Black</u>			
Fade Screen	b	62	Blk 0 ↵
<u>Unit Reset</u>			
Reset Unit	Esc P 99 ↵	1B+50+39+39	Updated ↵
<u>Query Software Version</u>			
	Q/q	51/71	QVER [X3] ↵
<u>Request Part Number</u>			
	N/n	4E/6E	N60-243-01 ↵ (for RGB 302) N60-244-01 ↵ (for RGB 304)

Request Information

I/i 49/69
Hph [X2]•Vph [X2]•Brt [X2]•Pkg [X1]•Syn [X6]•Mem [X7]•Exe [X7]•Mut [X7]•Blk [X7]•Fnc [X5]•Hrt [X4]•Vrt [X4] ↵

Example: Hph-112•Vph+009•Brt+000•Pkg1•Syn6•Mem1•Exe1•Mut0•Blk0•Fnc1•Hrt 031.47•Vrt059.94 ↵

Where:

Horizontal Shift (Hph)	=	-112
Vertical Shift (Vph)	=	+9
Level (Brt)	=	0
Peaking (Pkg)	=	1
Sync Mode (Syn)	=	6 (Separate H & V with H = negative and V = positive)
Memory Cycling (Mem)	=	1 (Enabled)
Executive Mode (Exe)	=	1 (On – Front Panel Locked Out)
Backlite Automode (Mut)	=	0 (Off – Backlite stays lit)
Fade to Black (Blk)	=	0 (Off – Not faded)
Menu Language (Fnc)	=	1 (Menu language is English)
Horizontal Scan Rate (Hrt)	=	31.47 kHz
Vertical Scan Rate (Vrt)	=	59.94 Hz

Error Codes

Code	Description
E10	Invalid command
E13	Invalid value (too large)
E14	Illegal command for this configuration (DIP Switch 1 is set ON for Digital Display Sync Processing and Horizontal/Vertical Shift is requested)

RGB 302/304-Initiated Messages

When a local event takes place, such as a Front Panel operation, the RGB 302/304 responds by sending a message to the Host. These RGB 302/304-initiated messages are listed below. As an example, the RGB 302 messages would be:

(C) COPYRIGHT 1998, EXTRON ELECTRONICS RGB 302, VX.XX ↵

This message appears when AC power is first applied. (X.XX is the software version number.)

Reconfig ↵

A change has been detected from the Front Panel, or a change in scan rate frequency has been detected, or an operation has occurred that requires a new memory block to be written. No response is expected from the host, but the host program, as an example, may want to request new status (l or i command).

Reset ↵ and Updated ↵

These messages appear upon a System Reset from the Front Panel.

Fnc^{x5} ↵

The Menu language has been changed from the Front Panel.

Exe^{x7} ↵

The keyboard has been locked/unlocked from the Front Panel.

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