XtendView

Video Distribution System

Revision B — April 20th 2005

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SPECTRUM

DOCUMENT

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INTRODUCTION

PRODUCT OVERVIEW

The RGB Spectrum *XtendView*™ is a family of signal distribution products designed to provide view of high resolution images at high quality over distances up to 1500 ft.

The system consists of a transmitter and receiver connected together by low cost, robust unshielded twisted pair cable (UTP Category 5, 5e or 6).

SYSTEM FEATURES

The *XtendView* includes the following features and functions:

- Wide range of analog RGB inputs signals
- Line level audio channel
- Simple and convenient installation
- Distance up to 1500 ft. (SXGA)
- Supports graphics resolutions up to 1900x1400
- Supports RGB, component video HDTV, composite and S-Video signals
- Internal skew compensation (option on some models)
- Point to point and point to multi-point distribution
- Compact
- Robust

SYSTEM CONFIGURATION

The *XtendView* distribution system can be configured to support both point to point and point to multipoint using the multidrop capability of the *XtendView* receivers.

CHOICE OF CABLE

In all configurations, UTP cable is used to interconnect the transmitter and receivers. The *XtendView* system works well with Category 5 cable which is the most popular type of UTP cable, but will also work with other types of cable such as Category 5E or Category 6.

IMPORTANT NOTE

Applications requiring cable lengths in excess of 500 ft. may prove difficult because of the effects of cable skew. The choice of cable becomes more critical and it should be noted that using more expensive CAT-5 cable in your installation may actually make the situation worse. This is due to the fact that UTP cable is typically optimized for use with Local Area Networks (LANs) and this does not necessarily improve the characteristics required for analog signal distribution. Depending upon the choice of cable you may need to use the optional skew compensation available for the *XtendView* RXLG and RXLV receivers.

Refer to **Appendix A** (page 25) for important information on cable type and connector wiring.

POINT TO POINT CONFIGURATION

The simplest configuration is a point to point system providing connection from a single source to a single destination. A point to point system consists of a single *XtendView* transmitter connected via UTP cable to a single *XtendView* receiver.

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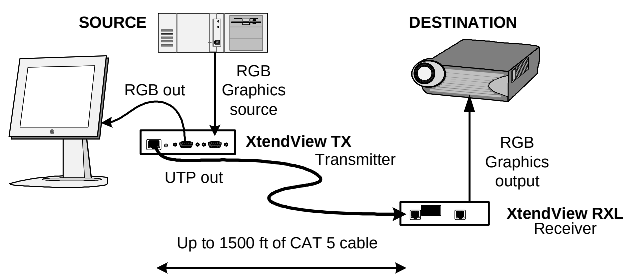

Figure 1-1. *XtendView* **point to point distribution system**

The figure above shows a schematic view of a point to point distribution system for cable lengths up to 1500 ft. The maximum distance possible is determined by the type of receiver used. The longest distances are provided by the *XtendView* RXLG and *XtendView* RXLV receivers. In applications requiring shorter lengths, the lower cost RXSL receiver can be used.

Note that the RGB output of the *XtendView* TX transmitter can be used to provide local monitoring of the signal that is being transmitted to the remote destination. Note also that the RGB output is an active output which means that power must be applied to the *XtendView* TX transmitter in order for the RGB output to be active (it is not a passive loop through).

MULTI-DROP CONFIGURATION

In some installations there are multiple destinations that are physically separate. This can be accomplished by using multiple receivers connected in a "daisy chain" configuration as shown in the following figure.

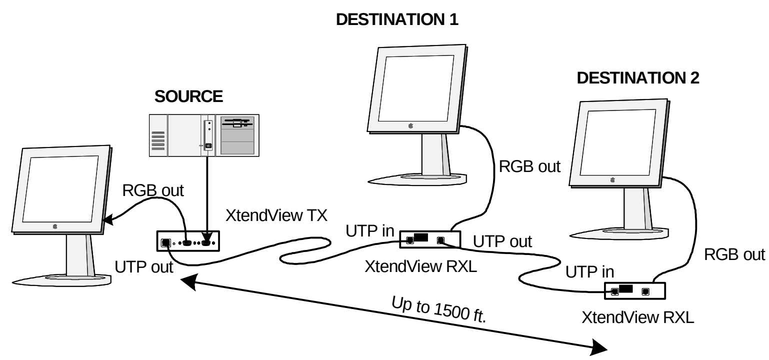

Figure 1-2. *XtendView* **point to multi-point distribution system**

You can add additional destinations by cascading additional receivers, connecting the UTP output of each receiver to the UTP input of the next receiver. Note that the calculation of cable length for each receiver is the total length of the cable from the *XtendView* transmitter to the last receiver in the chain, not the length of the previous segment. In the example above for instance, the *XtendView* RXL receiver at destination 2 cannot be more than 1500 ft. from the *XtendView* TX. Also note that the UTP output is an active output which means that disconnecting power to an upstream *XtendView* receiver will disable the UTP signal to downstream receivers.

CONTACT RGB SPECTRUM

For information regarding sales, system options or customer support, RGB Spectrum can be reached via phone, fax, mail and e-mail as listed below:

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- E-Mail (sales and product information): **sales@rgb.com**
- Website: **http://www.rgb.com**

XTENDVIEW TX

2

INTRODUCTION

The RGB Spectrum *XtendView* TX transmitter is a compact unit that is compatible with all *XtendView* receivers. Note that it is the choice of receiver and cable that determines the maximum length of cable that you can use.

The transmitter accepts a wide range of analog video graphics signals and transmits them together with audio signals over UTP cable.

This section provides details about configuring and connecting the *XtendView* **TX** for use in your UTP distribution system.

INSTALLING THE XTENDVIEW TX

Installation of the *XtendView* TX involves connecting the video and audio signal, UTP cable and power.

CONNECTOR LOCATIONS

Connections to the *XtendView* TX are on the front and rear of the product as shown in the following annotated figures.

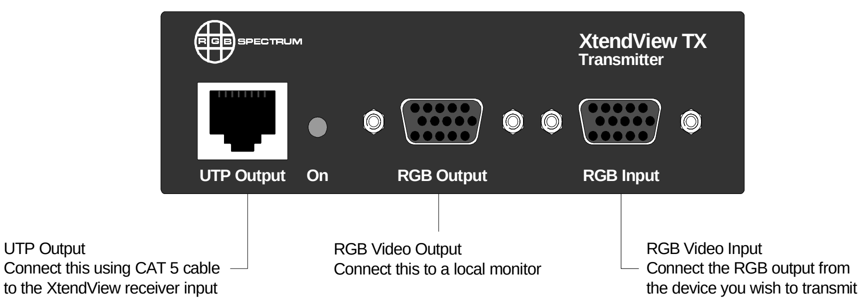

Figure 2-1. *XtendView* **TX Front Panel connections**

RGB input and output connectors and the UTP output connector are located on the *XtendView* TX front panel. The RGB output is a looping output from the RGB input. Use this connector if you want to monitor the input locally.

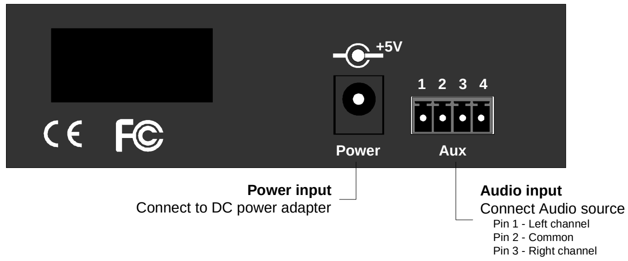

Figure 2-2. *XtendView* **TX Rear Panel connections**

Power and audio connectors are located on the *XtendView* TX rear panel (Figure 2-2). Use the power adapter provided to supply DC power to the unit. Audio should be connected as described in the subsequent section.

CONNECTING THE TRANSMITTER

Use the following procedure to connect your *XtendView* TX transmitter to your UTP distribution system.

1. Connect a standard 15 pin VGA cable to the RGB input connector (if you are using composite or S-Video signals use a VGA to BNC adapter cable) and connect the other end of the cable to your PC or video source (Figure 2-1). If you need information on cables or connector pinouts please consult the “Video Inputs” section below for information.
2. If you are using audio, connect a cable from your PC or audio source to the *XtendView* TX Aux Input connector. You will need to wire the audio cable to the four pin Phoenix connector supplied with the *XtendView* TX transmitter (for details see “Audio Connections” on page 28).
3. Connect UTP cable from the *XtendView* TX transmitter UTP output. The other end of this cable will be connected to the *XtendView* receiver.

VIDEO INPUTS

The *XtendView* TX supports the transmission of the following video signals

- RGBHV (5 wire analog RGB)
- RGBS (4 wire analog RGB)
- RGsB (3 wire analog RGB
- YUV (component analog video)
- YPbPr (HD video with tri-level sync)
- Composite Video (NTSC or PAL)
- S-Video (NTSC or PAL rates)

All video signals are connected to the RGB input connector with pin outs as shown in Table A-2 (page 26). Note that the pin outs are compatible with standard VGA cables. A variety of standard cables are available commercially.

ADVANCED SET UP

The *XtendView* TX transmitter is pre-configured in the factory to suit most applications. The following section deals with two system configurations that you may need in your specific application. The two configurations are:

- Output sync termination
- DC restore

OUTPUT SYNC TERMINATION

The H and V sync outputs of the RGB output connector are normally terminated with a 75 Ω termination. In some installations it may be necessary to un-terminate these signals. This may be accomplished by installation of jumpers inside the unit using the following procedure:

- Remove power from the *XtendView* TX
- Remove the screw at the top front of the unit
- Remove the top of the unit
- Referring to (**Figure 2-3**) place jumpers into locations JP3 and JP4.
- Replace the top and install the top retaining screw.

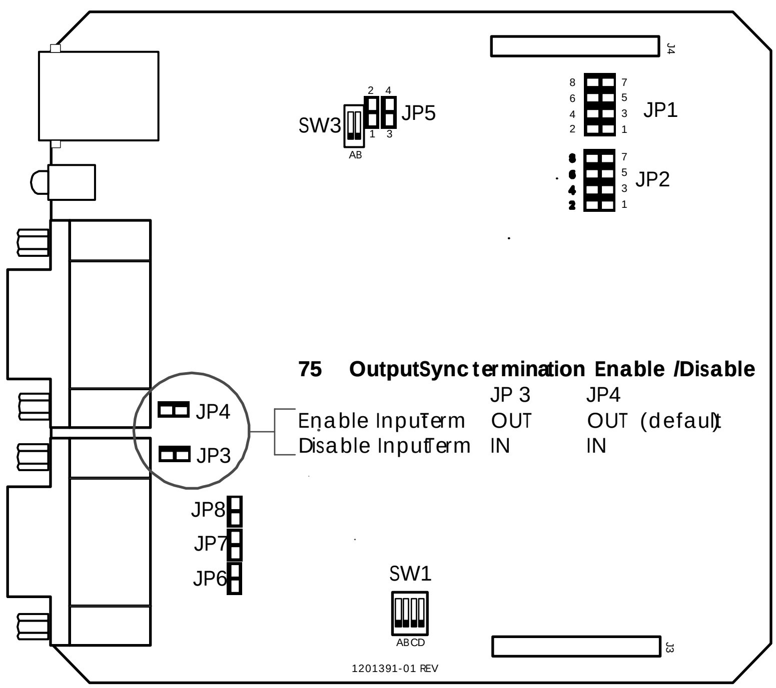

Figure 2-3. Jumper Settings for Output Sync Termination

DC RESTORE

RGB output signals are normally DC coupled with black level referenced to 0 volts. If your input signals do not have black level at this level you have the ability to correct this by using DC restoration within the*XtendView* TX transmitter. This may be accomplished by a switch setting inside the unit as described in the following procedure:

- Remove Power from the *XtendView* TX transmitter
- Remove the screw at the top front of the unit
- Remove the top of the unit
- Place switch SW1 into the positions shown in Figure 2-4
- Replace the top and install the top retaining screw.

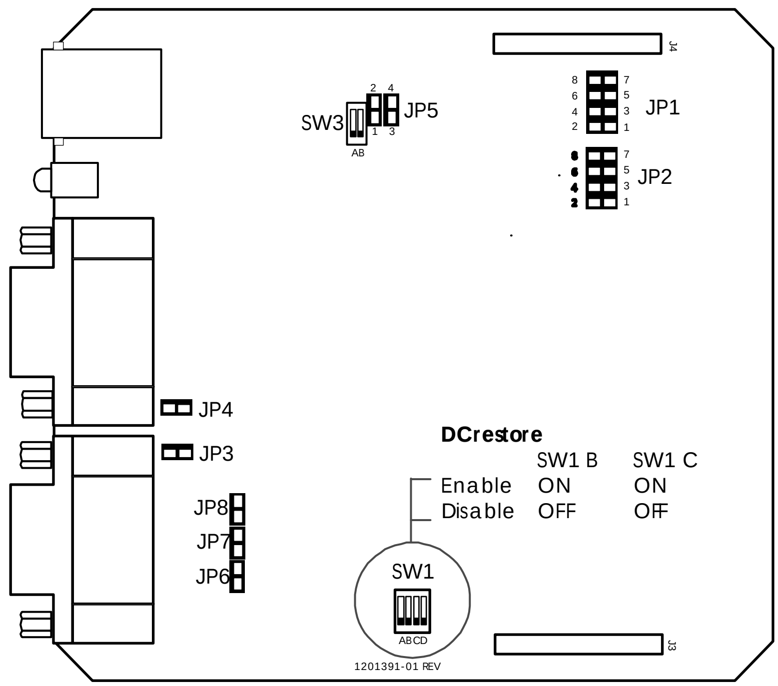

Figure 2-4. Switch setting for DC Restore

XTENDVIEW RXL RECEIVERS

3

INTRODUCTION

The RGB Spectrum *XtendView* product line includes both extended and standard range receivers. These models are all compatible with the *XtendView* TX transmitter described in **Chapter 2, "XtendView TX."** (page 4). This chapter details the installation and alignment instructions for the *XtendView* RXL series of receivers. This family of extended range receivers supports transmission over distances as long as 1500 ft. See the next chapter for information regarding installation of the standard range (up to 500 ft.) RXSL receiver.

INSTALLING THE *XtendView* RXL

Installation of the *XtendView* RXL receiver involves connecting the UTP cable, video and audio output cables and power. After installation a simple alignment procedure optimizes the receiver for immediate use. Note that compensation and skew adjustments are made for each receiver in the system. In a multi-drop system, adjustments on receivers upstream of the receiver you are adjusting have no impact on the calibration of any of the downstream receivers. Each receiver in a multi-drop system will require independent calibration.

CONNECTOR LOCATIONS

Connections to the *XtendView* RXLG and RXLV receivers are on the front and rear of the products as shown in the following annotated figures.

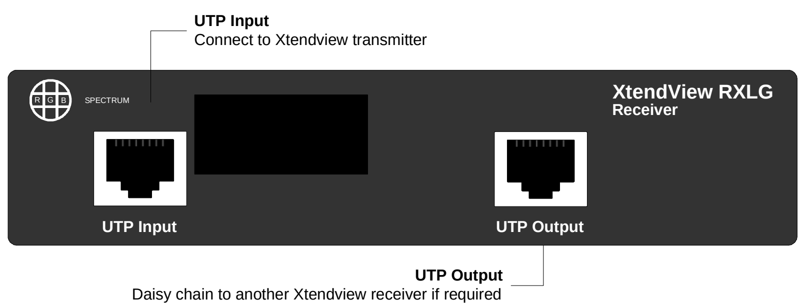

Figure 3-1. *XtendView* **RXLG and RXLV Front Panel Connections**

There are two UTP connectors located on the front panel of the *XtendView* RXLG and RXLV receivers. The left hand connector is the UTP input connector which should be connected to the output of the *XtendView* TX transmitter. The UTP output connector is used as an output to distribute the incoming signal to an additional receiver in a “daisy chain” fashion as shown in **Chapter 1** (page 1).

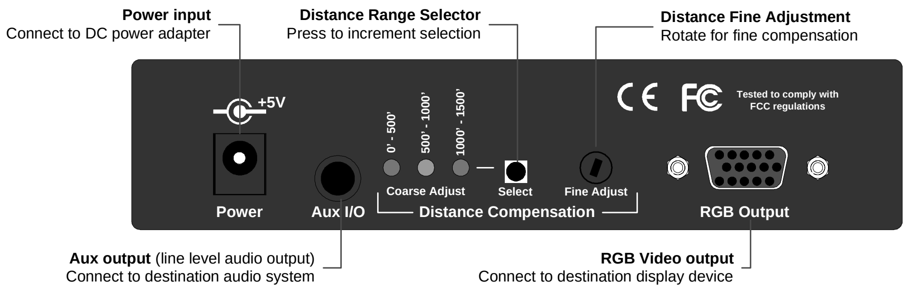

Figure 3-2. *XtendView* **RXLG and RXLV Rear Panel Connections**

The video and audio connections are located on the rear of the unit as shown in the figure above.

SIGNAL TYPES

There are two models of *XtendView* RXL receivers each of which support a different set of output signals. Note that the *XtendView* TX is used for all models of receiver.

The *XtendView* RXL supports the transmission of the following video signals

- RXLG receiver supports the following formats:
  - ~ RGBHV (5 wire analog RGB)
  - ~ RGBS (4 wire analog RGB)
- RXLV receiver supports the following formats:
  - ~ RGsB (3 wire analog RGB
  - ~ YUV (component analog video)
  - ~ YPbPr (HD video with tri-level sync)
  - ~ Composite Video (NTSC or PAL)
  - ~ S-Video (NTSC or PAL rates)

Both receivers have dual mono audio outputs.

CONNECTING THE RECEIVER

Use the following procedure to connect your *XtendView* RXL receiver to your destination device.

1. Connect UTP cable from the *XtendView* TX transmitter UTP output to the *XtendView* TRX receiver UTP input (Figure 3-1).
2. Connect a standard 15 pin VGA cable to the RGB output connector (if you are using composite or S-Video signals use a VGA to BNC adapter cable) and connect the other end to your destination display (Figure 3-2).
3. Connect a 3.5 mm stereo jack plug to the Aux IO connector and connect to the line level input of your destination device (Figure 3-1).
4. Connect the 5 VDC output of the power adapter to the *XtendView* RXL power connector and connect the power adapter AC input to a reliable AC power source (Figure 3-2).

For information on cables and connector pin outs please refer to *Appendix A*, (page 25).

CALIBRATION

Picture quality is affected by the type and length of the UTP cable that is connected between the transmitter and receiver. The *XtendView* receiver provides controls that can be used to optimize the picture quality for lengths from 0 - 1500 ft. This is accomplished in conjunction with the test image (Figure 3-3) that was supplied on the CD ROM with your *XtendView* system. Note that the transmitter does not require any calibration.

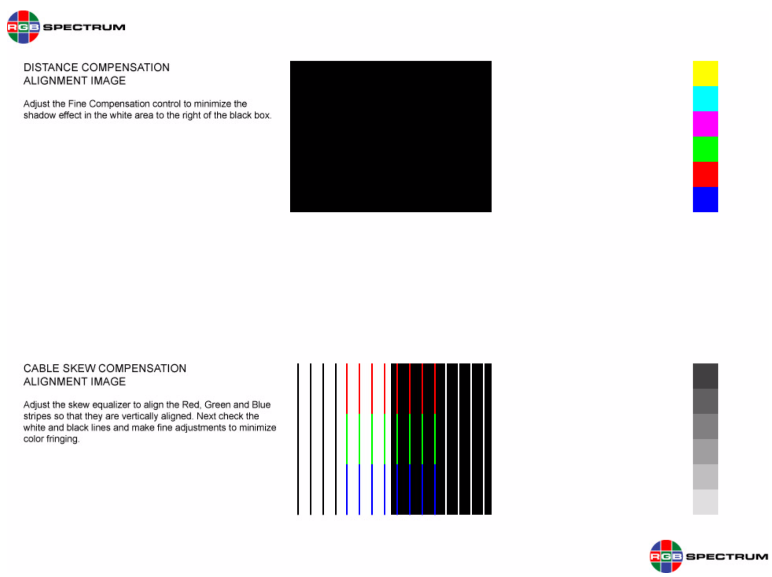

Figure 3-3. Test Alignment Image

By using the test alignment image, calibration is a simple two step process.

1. Compensate for signal loss by using the Distance Compensation adjustment.
2. Compensate for the differential delay (skew) between the Red, Green and Blue channels by using the optional skew compensation.

DISTANCE COMPENSATION

Use the following procedure to compensate for the cable length:

1. Display the test image (Figure 3-3) on the PC connected to the *Xtend-View* TX transmitter.
2. Rotate the “Fine Adjust” control (Figure 3-2) fully counterclockwise.
3. Using a small blunt instrument (ball point pen for example) press the “Select” button until the leftmost LED is illuminated. This corresponds to a cable length between 0 and 500 ft. in length.
4. On the display device attached to the receiver output, view the area of the test image to the right of the black box and rotate the “Fine Adjust” control until the image is sharp but free of shadowing (streaking) in the white area to the right of the box (Figure 3-4 shows an under-compensated image).
5. If the output image does not look clear then press the ”Select” button again to select the next step (500-1000 ft.)and repeat step 4. If necessary press the select button again to select the maximum range setting and repeat step 4.

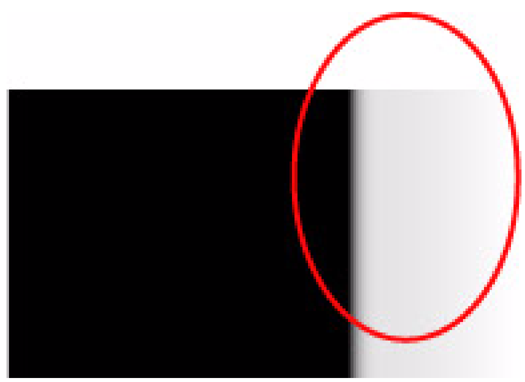

Figure 3-4. Streaking resulting from incorrect distance compensation

A correctly adjusted image should not exhibit streaking (under-compensated) or ringing (overcompensated) artifacts. The transition between the black box and the white background should be crisp and free of black or white trails to the right of the box. See Figure 3-3 for a view of a test image when the distance and skew compensation have been correctly set.

SKEW COMPENSATION

The alignment image has a set of Red, Green and Blue vertical stripes over a white and black background. These stripes are used to show the relative delay of the Red, Green and Blue channels to each other.

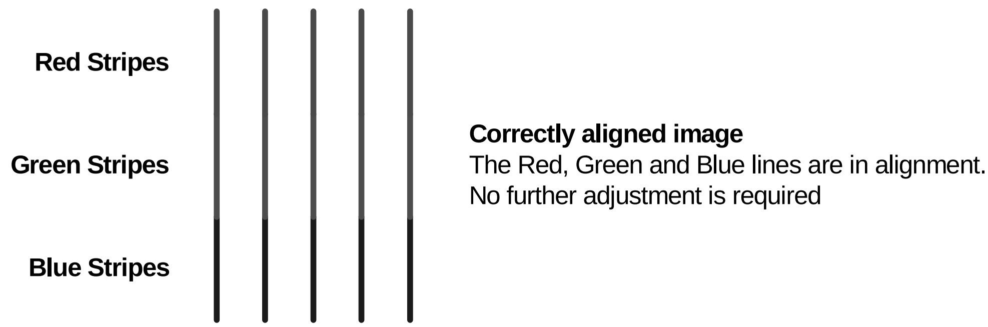

Figure 3-5. Alignment image correctly aligned

If the alignment image does not appear as shown above, then cable skew adjustment is required. The adjustments of the optional skew compensator are located on the top of the Xtendview receiver as shown in the following figure.

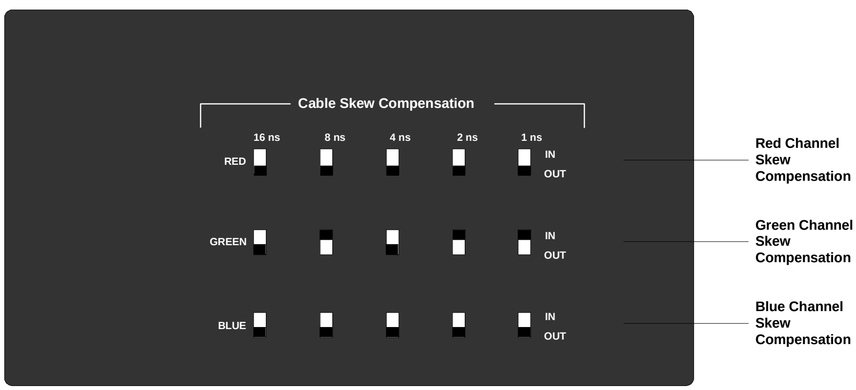

Figure 3-6. *XtendView* **RXL top view showing optional skew adjustments**

Skew compensation is independently adjustable for each color channel. The controls consist of a set of five slide switches for each color channel. The slide switches have two positions, labeled IN and OUT. When a switch is set to the IN position it adds a delay of the amount shown at the top of the associated column. Each switch adds a different amount of delay, with the total delay being the sum of all the switches associated with each color channel. For example the total delay of the Green channel in Figure 3-6 above is 8 + 2 + 1 = 11 nanoseconds (ns).

If the cable has significant time offset (skew) between components, the arrangement of stripes will not be as shown in the Figure 3-5. An example of a misaligned system is shown in the Figure 3-7 below.

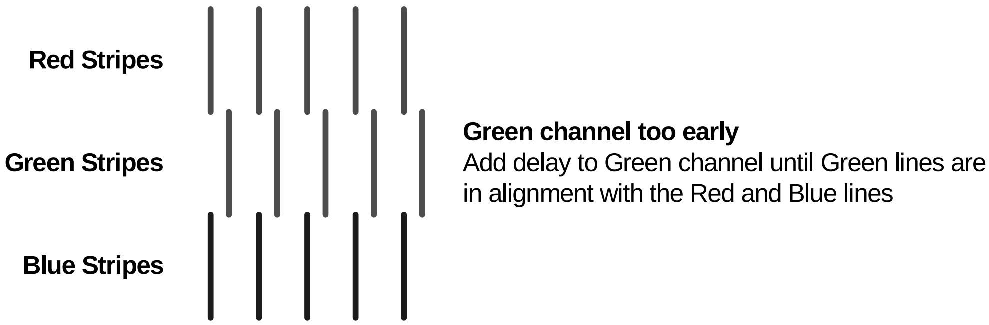

Figure 3-7. Alignment image with Green channel misaligned

All signals suffer delay as they travel down the cable, but the delay for the individual color channels is not always identical. This differential delay is also known as Cable Skew and causes the image to have colored edges particularly visible in areas with fine detail.

The strategy for cable skew compensation is to identify the channel (or channels) with the worst delay, and then to add delay to the color channels with less to match the delay of the channel with the longest cable delay. After the procedure is complete, the reference channel (the channel with the longest cable delay) will have no (zero) compensation and the other channels will have compensation added to align them to the reference channel.

To make cable skew compensation adjustments you will be inserting delay using the compensation switches located on the top of the Xtendview receiver. These are two position slide switches that are recessed to prevent accidental operation. Use a blunt device to move a switch fully to either the IN or OUT position. If you inadvertently place a switch in the mid position incorrect operation of the Xtendview receiver may result. Anomalies such as strong color tint or loss of output may result from these switches not being in the fully IN or OUT position.

Use the following procedure to adjust the cable skew compensation:

1. Display the alignment image on the PC connected to the input of the Xtendview transmitter
2. View the alignment image on a display connected to the output of the Xtendview receiver
3. Set the delay for all three color channels to zero by setting each compensation switch to the OUT position. The compensation switches are two position slide switches.
4. Establish which colored strip is offset to the left of the other channel(s). This will be your reference color channel. You will not add any delay to this color channel.

5. Choose one of the other color channels and use the compensation switches for that channel in order to add delay. Switch the leftmost switch to the IN position to add the maximum delay increment (16 ns). If the stripe moves too far to the left, return this switch to the OUT position and switch in delay using the next switch to the right. Continue with this procedure until the color stripe is in vertical alignment with the reference color channel.
6. Repeat step 5 for the other color channel as needed.

For the example shown in Figure 3-7 you would need to add delay to the Green channel only. However you may need to add delay to two channels to match the third channel as you will see in the next example.

Always use the color channel that is at the left of the group of stripes as your reference. For example in Figure 3-8 the channel that should not require any delay is the Red channel. In this example both the Green and Blue channels have suffered less cable delay than the Red channel. Since the Blue and Green channels have different delays, they will need to be delayed differently from each other in order to match the Red Channel.

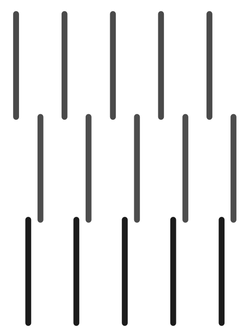

Figure 3-8. Alignment image with Green and Blue channels misaligned

If you have correctly made the distance and skew compensation adjustments the alignment procedure is complete and you should now have excellent picture quality.

A correctly adjusted image should not exhibit color fringing on the black and white areas of the image. See Figure 3-3 for a view of a test image when the distance and skew compensation have been correctly set.

XTENDVIEW RXSL RECEIVER

4

INTRODUCTION

For applications requiring a total cable length of less than 500 ft., the *XtendView* RXSL receiver is a very cost effective choice. The *XtendView* RXSL receiver is fully compatible with the *XtendView* TX transmitter described in **Chapter 2, "XtendView TX."** (page 4). This chapter details the installation and alignment instructions for the *XtendView* RXSL receiver. See the previous chapter for information regarding installation of the RXL receivers.

CONFIGURATION

The *XtendView* RXSL receiver is factory configured to operate with RGB signals and left + right audio. If this is the configuration that you will be using then you may skip this section and go straight to the installation section on page 18.

By re-configuring the receiver, the *XtendView* RXSL can be used with a variety of other signals as shown in the following list:

VIDEO SIGNAL TYPES

- ~ RGBHV (5 wire analog RGB)
- ~ RGBS (4 wire analog RGB)
- ~ RGsB (3 wire analog RGB
- ~ YUV (component analog video)
- ~ YPbPr (HD video with tri-level sync)
- ~ Composite Video (NTSC or PAL)
- ~ S-Video (NTSC or PAL rates)

AUDIO SIGNAL TYPES

The *XtendView* RXSL supports two types of analog audio.

- ~ Summed audio (Left + Right)
- ~ Stereo audio

SUMMED AUDIO

The *XtendView* TX accepts stereo audio inputs and sums them into a single signal containing both left and right audio inputs. This mode of operation is available with the full variety of video signal types and is the default setting of the *XtendView* RXSL receiver.

STEREO AUDIO

When the *XtendView* RXSL receiver is used with a composite video signal the receiver may be configured to receive true stereo audio. Note that this configuration is not available with RGB, YPbPr or S-Video signals. The default configuration for audio is the summed audio mode. To select the stereo mode you will need to change jumper settings as detailed in the next section.

JUMPER SETTINGS

The *XtendView* system dedicates three of the four pairs in the UTP cable for transmission of a primary signal. The fourth pair is used as an auxiliary channel which may be set by the user for different purposes. For example the auxiliary channel may be used to transmit an audio channel or an additional composite video channel. Conversion between different configurations is accomplished simply by changing the position of jumpers inside the unit. Refer to **Table 4-1** to determine how the jumpers should be set for each configuration. For the physical location of the jumpers please refer to **Figure 4-1**.

Table 4-1. *XtendView* RXSL Configuration Jumper Settings

Primary Channel	Auxiliary Channel	JP1	JP7	JP8	JP12	JP13
RGB (3,4 or 5 wire)	L + R Audio	IN	IN	OUT	1-2	OUT†
RGB (3,4 or 5 wire)	Composite Video	IN	OUT	IN	1-2	OUT†
Composite video	L + R Audio	OUT	IN	OUT	1-2	OUT†
Composite video	Stereo Audio	OUT	OUT	OUT	2-3	OUT†
Composite video	Composite Video‡	OUT	OUT	IN	1-2	OUT†
S-Video	L + R Audio	OUT	IN	OUT	1-2	OUT†
S-Video	Composite Video‡	OUT	OUT	IN	1-2	OUT†
YPbPr	L + R Audio	OUT	IN	OUT	1-2	OUT†
YPbPr	Composite Video‡	OUT	OUT	IN	1-2	OUT†

The receiver is factory configured for operation with RGB 3,4 or 5 wire operation.

† Jumper JP13 is not installed except when multiple *XtendView* receivers are used in an installation where receivers are daisy chained between UTP ports (multi-drop). In this case, the receiver at the end of the chain should be configured with jumpers installed in JP13 1-2 and JP13 3-4.

‡Connect the composite video signal cable to the auxiliary connector as shown in the cable section.

ACCESSING THE JUMPERS

To access the jumpers you will need to remove the *XtendView* RXSL top cover by removing a single Phillips head screw. Use a Phillips screwdriver (#1) to remove the screw located at the top rear of the unit and remove the cover. Note that you do not need to remove the board from the chassis.

Figure 4-1 shows a view of the receiver with the top cover removed noting the position of the jumpers referred to in **Table 4-1**.

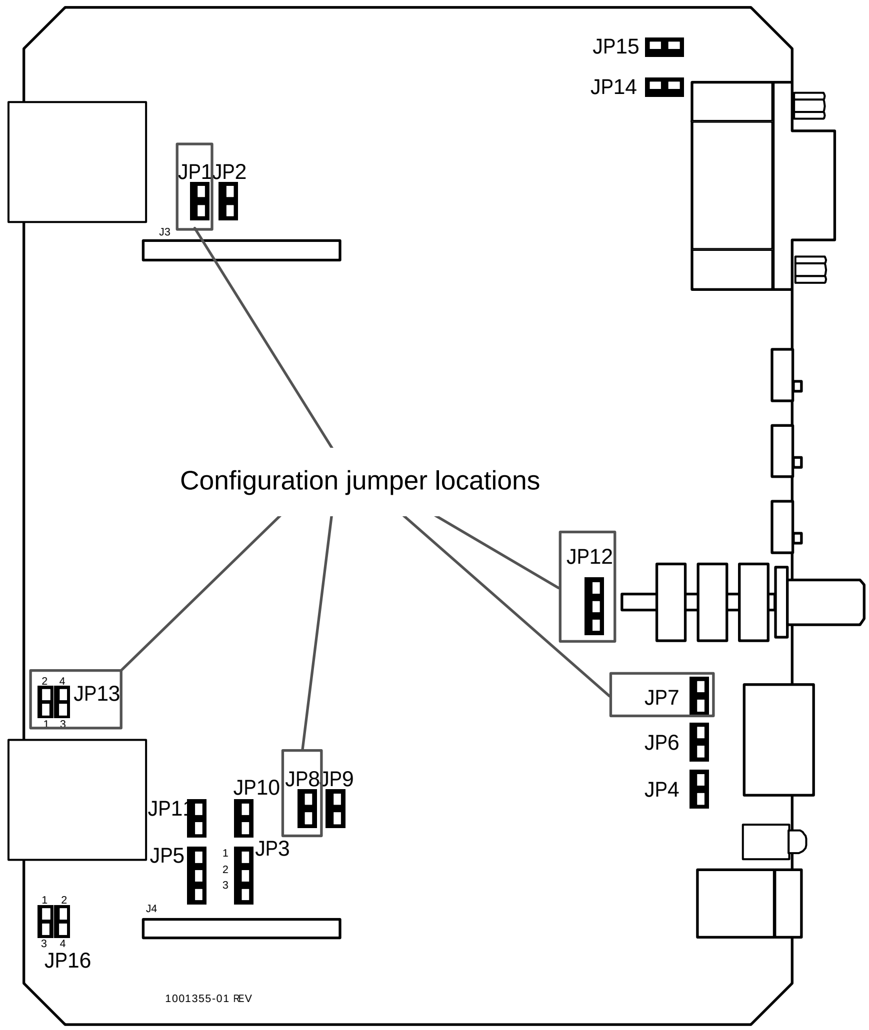

Figure 4-1. *XtendView* RXSL configuration jumper locations

NOTE: Jumpers in the “IN” position are connected between the two pins of the header. Jumpers in the “OUT” position may be removed completely, or connected to a single pin of the header (a convenient way to store them).

After you have made the jumper settings, replace the top cover and re-install the Phillips retaining screw.

INSTALLATION

Installation of the *XtendView* RXL receiver involves connecting the UTP cable, video and audio output cables and power. After installation, a simple alignment procedure optimizes the receiver for immediate use. Note that compensation and skew adjustments are made for each receiver in the system. In a multi-drop system you must adjust each receiver independently. Adjustments upstream of a receiver have no effect on downstream units.

CONNECTOR LOCATIONS

Connections to the *XtendView* RXSL receiver are on the front and rear of the products as shown in the following figures.

Figure 4-2. *XtendView* **RXSL Front Panel Connections**

There are two UTP connectors located on the front panel of the RXSL receiver. The left hand connector is the UTP input connector which should be connected to the output of the TX transmitter. The UTP output connector is used as an output to distribute the incoming signal to an additional receiver in a "daisy chain" fashion as shown in **Figure 1-1** (page 2).

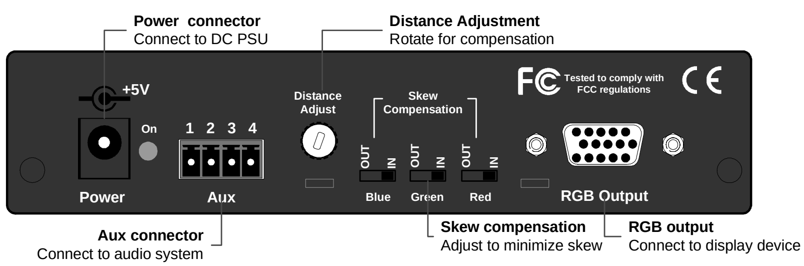

Figure 4-3. *XtendView* **RXSL Rear Panel Connections**

The video and audio connections are located on the rear of the unit as shown in the figure above.

CONNECTING THE RECEIVER

Use the following procedure to connect your *XtendView* RXSL receiver to your destination display.

1. Connect UTP cable from the *XtendView* TX UTP output to the *XtendView* RXSL receiver UTP input (Figure 4-2).
2. Connect a standard 15 pin VGA cable to the RXSL receiver RGB output connector (if you are using composite or S-Video signals use a VGA to BNC adapter cable) and connect the other end to your destination device (Figure 4-3).
3. Connect a 4 pin Phoenix connector to the Aux connector and connect to your audio amplifier (Figure 4-3).
4. Connect the 5 VDC output of the power adapter to the *XtendView* RXSL power connector and connect the power adapter AC input to a reliable AC power source (Figure 4-3).

For information on cables and connector pin outs please refer to *Appendix A*, (page 25).

CALIBRATION

Picture quality is affected by the type and length of the UTP cable that is connected between the transmitter and receiver. The *XtendView* RXSL receiver provides controls that can be used to optimize the picture quality for lengths from 0 - 500 ft. This is accomplished in conjunction with the test image (Figure 4-4) that was supplied on the CD ROM with your *XtendView* system. Note that the transmitter does not require any calibration.

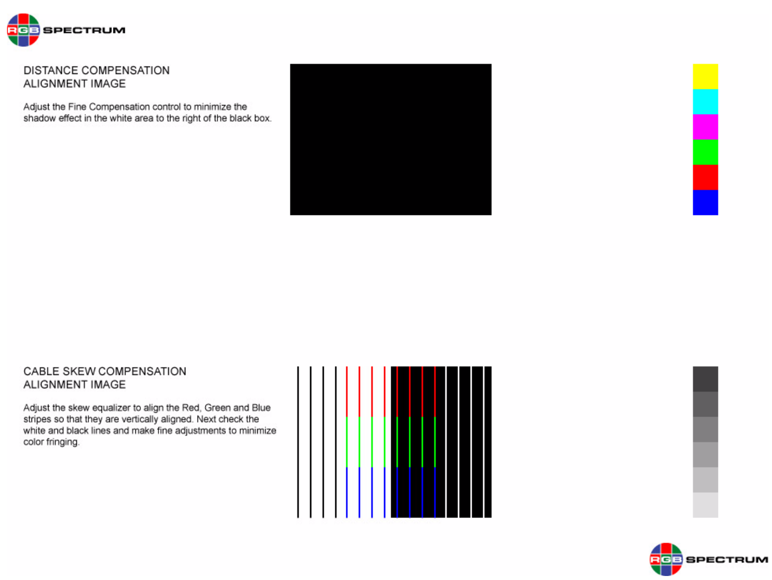

Figure 4-4. Test Alignment Image

By using the test alignment image, calibration is a simple two step process.

1. Compensate for signal loss by using the Distance Adjust control.
2. Compensate for the differential delay (skew) between the Red, Green and Blue channels by using the Skew compensation switches.

DISTANCE COMPENSATION

Use the following procedure to compensate for the cable length:

1. Display the test image (as shown in Figure 4-4) on the PC connected to the *XtendView* transmitter.
2. Rotate the "Distance Adjust" control (Figure 4-3) fully counterclockwise.
3. On the display device attached to the receiver output, view the area of the test image to the right of the black box and rotate the "Distance Adjust" control until the image is free of shadowing in the white area to the right of the box (Figure 4-5 shows the streaking caused by insufficient distance compensation).

Figure 4-5. Alignment image with incorrect distance compensation

A correctly adjusted image should not exhibit streaking (under-compensated) or ringing (overcompensated) artifacts. The transition between the black box and the white background should be crisp and free of black or white smears to the right of the box. See Figure 4-4 for a view of a test image when the distance and skew compensation have been correctly set.

SKEW COMPENSATION

The alignment image has a set of Red, Green and Blue vertical stripes over a white and black background. These stripes are used to show the relative delay of the Red, Green and Blue channels to each other.

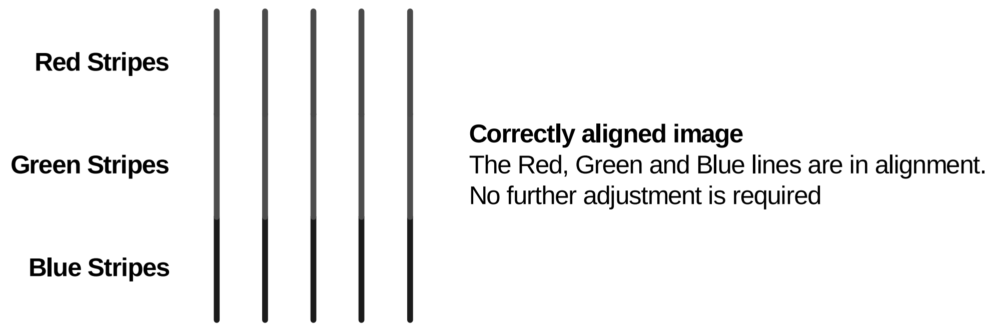

Figure 4-6. Alignment image correctly aligned

If the alignment image does not appear as shown above then cable skew adjustment is required. The adjustments of the skew compensator are located on the front panel of the Xtendview RXSL receiver as shown in the following figure.

Skew compensation is independently adjustable for each color channel. The controls consist of a single slide switch for each color channel. The slide switches have two positions, labeled IN and OUT. When a switch is set to the IN position it adds a delay of the 10 ns.

If the cable has significant time offset (skew) between components, the arrangement of stripes will not be as shown in the Figure 4-6. An example of a misaligned system is shown in the Figure 4-7.

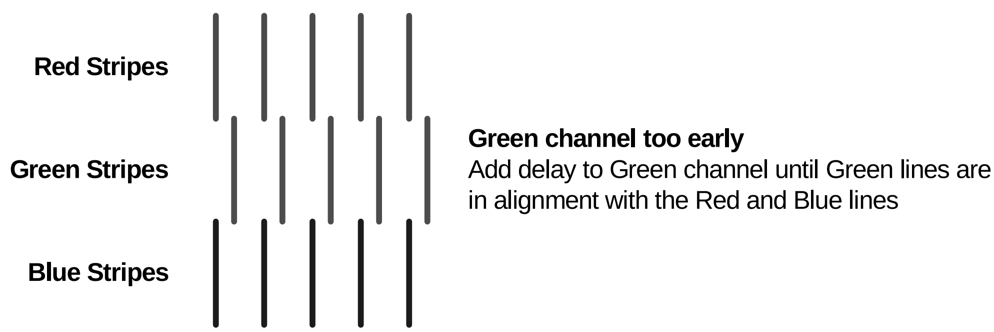

Figure 4-7. Alignment image with Green channel misaligned

All signals suffer delay as they travel down the cable, but the delay for the individual color channels is not always identical. This differential delay is also known as Cable Skew and causes the image to have colored edges particularly visible in areas with fine detail.

The strategy for cable skew compensation is to identify the color channel (or channels) with the worst delay, and then to add delay to the color channels with less delay to match the delay of the channel with the longest cable delay. After the procedure is complete, the reference channel (the channel with the longest cable delay) will have no (zero) compensation and the other channels will have compensation added to align them to the reference channel.

To make cable skew compensation adjustments you will be inserting delay using the compensation switches located on the front of the Xtendview XSL receiver. These are two position slide switches that are recessed to prevent accidental operation. Use a blunt device to move a switch fully to either the IN or OUT position. If you inadvertently place a switch in the mid position incorrect operation of the Xtendview receiver may result. Always check the position of these switches if you experience an output that is highly tinted, or the output is not visible.

Use the following procedure to adjust the cable skew compensation:

1. Display the alignment image on the PC connected to the input of the Xtendview transmitter
2. View the alignment image on a display connected to the output of the Xtendview receiver
3. Set the delay for all three color channels to zero by setting each compensation switch to the OUT position. The compensation switches are two position slide switches.
4. Establish which colored strip is offset to the left of the other color channel(s). This will be your reference color channel. You will not add any delay to this color channel.
5. Choose one of the other color channels and set the compensation switch for that channel in order to add delay. If the stripe moves too far to the left, return this switch to the OUT position.
6. Repeat step 5 for the other color channels as needed.

For the example shown in Figure 4-7 you would need to add delay to the Green channel only. However you may need to add delay to two channels to match the third channel as you will see in the next example.

Always use the color channel that is at the left of the group of stripes as your reference. For example in Figure 4-8 the color channel that should not require any delay is the Red channel. In this example both the Green and Blue channels have suffered less cable delay than the Red channel. Since the Blue and Green channels have different delays, they will need to be delayed differently from each other in order to match the Red Channel

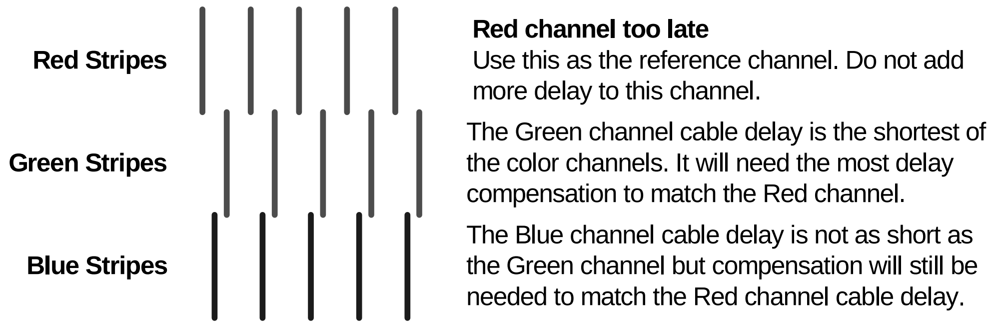

Figure 4-8. Alignment image with Green and Blue channels misaligned

If you have correctly made the distance and skew compensation adjustments the alignment procedure is complete and you should now have excellent picture quality.

ADVANCED SET UP

The *XtendView* RXSL is pre-configured in the factory to suit most applications. By default the H and V sync outputs of the RGB output connector are terminated with a 75 Ω termination. In some installations it may be necessary to un-terminate these signals but this may be simply accomplished by installation of jumpers inside the unit using the following procedure:

- Remove power from the *XtendView* RXSL receiver
- Remove the screw at the top rear of the unit
- Remove the top cover of the unit
- Referring to (Figure 4-9) place jumpers into locations JP14 and JP15.
- Replace the top and install the top retaining screw.

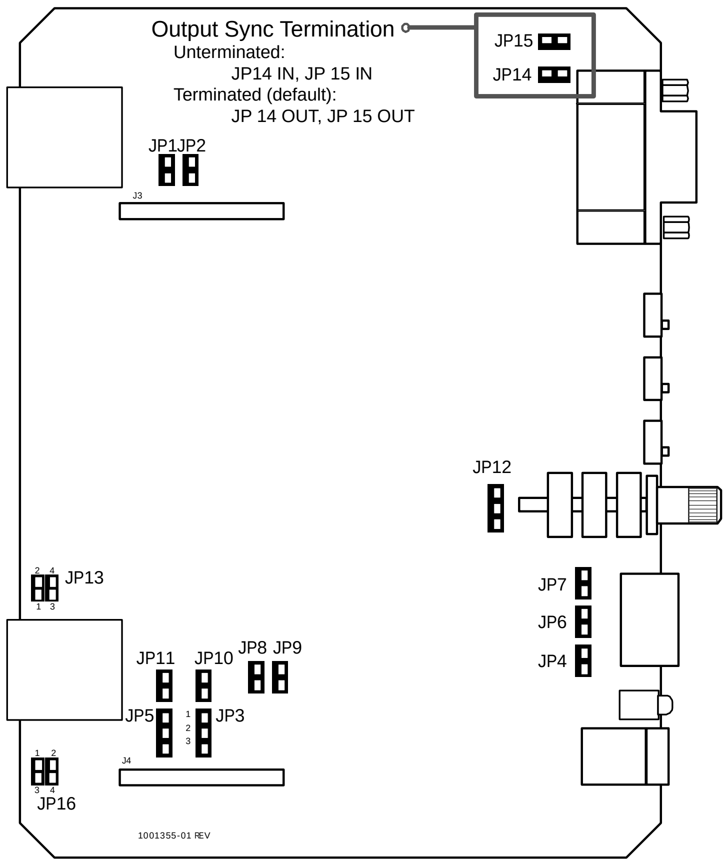

Figure 4-9. Jumper Settings for Output Sync Termination

Note that the factory (default) settings for JP14 and JP 15 are un-installed (OUT).

Cables and Connectors

A

Introduction

This appendix provides information about the cables, connectors and pin out used in the *XtendView* product family.

The following topics are covered.

- **Video Connections**
- **Audio Connections**
- **UTP Connections**
- **UTP Wiring problems**

VIDEO CONNECTIONS

CONNECTOR TYPE AND PINOUTS

The high resolution (RGB / YUV) inputs are connected using a sub miniature 15 pin D-type (HD-15), as shown below.

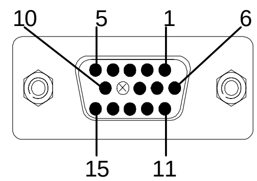

Figure A-10. RGB Analog Connector (viewed from front of chassis)

The table below lists signals for the 15 pin D-type (HD-15) connector, including the pinout for the RGB analog input for all signal types.

Commercially manufactured cables are readily available for various lengths for RGB applications. The majority of these applications use 15 pin sub miniature D connectors at each end of the cable.

Cables are also available terminated with a 15 pin sub-miniature at one end, and at the opposite end splitting out each signal to individual BNC connectors. These are particularly useful in applications using the YUV or composite or S-Video signals.

RGB and YUV signals consist of three separate components. The pin outs for the various format of component signals are shown in the following table.

Table A-2. RGB Analog Video Pinouts

Pin	RGBHV	RGBS	RGsB
1	Red	Red	Red
2	Green	Green	Green+sync
3	Blue	Blue	Blue
4	NC	NC	NC
5	NC	NC	NC
6	Red Shield	Red Shield	Red Shield
7	Green Shield	Green Shield	Green Shield
8	Blue Shield	Blue Shield	Blue Shield
9	no pin (key)	no pin (key)	no pin (key)
10	ground	ground	ground
11	ground	ground	ground
12	NC	NC	NC
13	H Sync	C sync	NC
14	V Sync	NC	NC
15	ground	ground	ground

Composite and S-Video signals use only a single circuit. The pin out for these signals is shown in the following table. If you wish to use commercially available cables, it is recommended that you use a VGA-BNC adapter cable. These cables are often color coded in accordance with the RGB application with the sub miniature D connector pinned out as shown in Table A-2, “RGB Analog Video Pinouts,” on page 26. For example the BNC connector associated with the GREEN channel will be color coded green, and will be connected to pin 2 of the sub miniature D connector. Table A-3 below shows the typical color coding for the BNC connectors together with the pin assignments for YUV (YPbPr), Composite video and S-Video signals.

Table A-3. Composite Video, S-Video and Component Video Pinouts

Pin	Color Code	YUV (YPbPr)	Composite Video	S-Video
1	RED	Pr, V	NC	C
2	GREEN	Y	Composite Video	Y
3	BLUE	Pb, U	NC	NC
4		NC	NC	NC
5		NC	NC	NC
6		Pr, V shield	NC	C shield
7		Y shield	Video shield	Y shield
8		Pb, U shield	NC	NC
9		no pin (key)	no pin (key)	no pin (key)
10		ground	NC	NC
11		ground	NC	NC
12		NC	NC	NC
13	-	NC	NC	NC
14	-	NC	NC	NC
15		ground	NC	NC

XTENDVIEW TX TRANSMITTER

The RGB output connector pin outs for the various forms of RGB signals are shown in Table A-2.

Refer to Table A-3 for pin out details for pin out of the RGB connector for composite video signals, component video signals or S-video signals.

XTENDVIEW RXL

The RGB output connector pin outs for the various forms of RGB signals are shown in Table A-2.

Refer to Table A-3 for pin out details for pin out of the RGB connector for composite video signals, component video signals or S-video signals.

XTENDVIEW RXSL

The *XtendView* RXSL receiver supports the transmission of an additional composite video signal using the *XtendView* auxiliary channel. The composite video signal is output on the Auxiliary connector at the rear of the receiver (**Figure 4-3**).

AUDIO CONNECTIONS

XTENDVIEW TX TRANSMITTER

The *XtendView* TX supports the transmission of audio signals. Pin out for this connector is shown in the table below.

Table A-4. Audio connector pin out

Pin	
1	Left channel
2	Shield
3	Right channel
4	NC

The audio inputs are line level and accept the left and right channels of a stereo or dual mono pair. Inside the transmitter these two channels are combined (summed) into a single channel for transmission over the UTP cable. At the receiver the two channels are provided as two identical line level outputs driving the left and right output channels.

XTENDVIEW RXL

The *XtendView* RXL uses a standard 3.5 mm stereo jack to provide the output audio signal. Ready made cables are widely available at retail and wholesale outlets.

XTENDVIEW RXSL

The *XtendView* RXSL receiver audio channel output signals are provided on the 4 position Auxiliary connector. Pin out for this connector is shown in the table below..

Table A-5. Audio connector pin out

Pin	
1	Left channel
2	Shield
3	Right channel
4	NC

The audio outputs are line level and provide the left and right channels of a stereo or dual mono pair depending upon the configuration of the receiver. For details about configuring the audio for the receiver please refer to **Jumper Settings** on page 16.

UTP CONNECTIONS

UTP (Untwisted pair) cable is used to interconnect the *XtendView* transmitter and receivers UTP cables were designed originally with telephone applications in mind, but later versions of the cable were developed to support applications such as Local Area Networks (LAN).

UTP CABLE TYPES

The type of UTP cable suitable for use with the *XtendView* includes CATEGORY 5, CATEGORY 5e and CATEGORY 6 cables. Although some applications of these cables use only 2 pairs of conductors, the *XtendView* application requires the use of 4 pairs of conductors. You must be sure when buying cable that the cable includes all 4 pairs of wires.

The primary use of UTP CATEGORY 5 and 6 cables is network cabling which demands specific requirements of the cable. This means that cable optimized for higher performance data applications may actually work worse in the analog video signal distribution application than lower cost cable.

Cable types that are recommended for the analog application are the cost effective Comtran 2881 and low skew Belden 7987R cable. Both of these cables are designed for normal office use. Installations that require cabling in cable trays or a part of the building infrastructure may be subject to building codes requiring the use of plenum rated cable. The Comtran 2347 and Belden 7987P are plenum rated cables electrically equivalent to the Comtran 2881 and Belden 7987R cables.

UTP CABLE TERMINATION

The UTP connector is a standard 8 pin RJ-45 modular connector. This connector was designed to be low cost and easy to terminate.

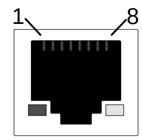

Figure A-1. UTP connector (viewed from rear of chassis)

It is extremely important that the cables are wired correctly from end to end. To assist in this the cable pairs are color coded as shown in the following table. The color code and pairing is specified by the EIA/TIA 568B standard and to avoid confusion should be adhered to exactly.

Table A-1. EIA /TIA 568B Connector Pinouts

Pin	Pair	Wire Color	Signal
1	2	White/Orange	RED+
2	2	Orange	RED-
3	3	White/Green	GREEN+
4	1	Blue	BLUE+
5	1	White/Blue	BLUE-
6	3	Green	GREEN-
7	4	White/Brown	AUX
8	4	Brown	AUX

It is important to use wires from the same pair for each pair of signals. The standard pairs are shown in **Table A-1**. Note that one wire of the pair has a solid color. The other wire (of the pair) is white with a stripe of the same color as the other wire (e.g., Orange and White/Orange).

UTP WIRING PROBLEMS

The most common problems with UTP transmission systems relate to problems with incorrectly wired or damaged UTP interconnect cables. Low cost cable testers are commercially available from several vendors that will rapidly diagnose the most common of these problems. This section contains detailed explanations for the more common types of problems.

EIA/TIA 568B CABLE CONNECTIONS

The standard EIA 568 B wiring for UTP cable is shown in schematic form in Figure A-2 (refer also to **Table A-1** on page 30). It is important that the interconnect cable be wired according to the EIA/TIA 568B standard. Adhering to this standard will assure correct operation and will greatly simplify cable related trouble-shooting.

CORRECTLY WIRED CABLE

The schematic figure below shows the correct wiring of the UTP cable in accordance with the EIA568 B standard.

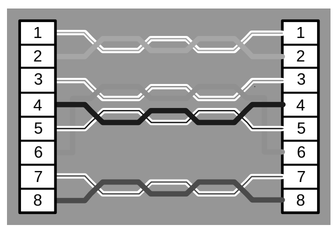

Figure A-2. Cable wired to EIA 568 B standard

The EIA/TIA 568 wiring standard was chosen to provide backward compatibility to a telephone standard and results in pair number 3 being wired differently than the other pairs. Although this looks counter-intuitive, it is very important to follow this wiring scheme exactly.

CABLE WITH SPLIT PAIRS

A very common form of wiring error is as shown in Figure A-3. At a casual glance this cable looks to be wired correctly as it is wired one to one, According to the EIA/568 B standard, the third pair should be connected between pins 3 and 6, and pins 4 and 5 should be treated as a pair. Although there is a one to one electrical connection between all pins on the connector, the pairs (3&6) and

(4&5) are both wired as split pairs.

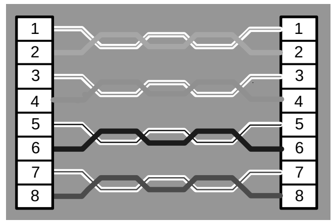

Figure A-3. Incorrectly wired cable (split pairs)

Split cables are a problem as the differential nature of the signals require that each signal be transmitted on the same pair of wires. Cable testers can be purchased that will detect this condition.

REVERSE PAIR

Another form of common miswiring is to swap (reverse) the position of a pair at one end of the cable (swapping at both ends does not cause an electrical problem, but will cause confusion due to the color codes being in the incorrect position.

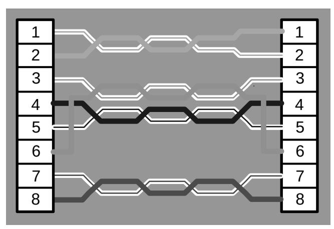

Figure A-4. Incorrectly wired cable (reverse pair)

In the example above pin 1 is connected to pin 2 at the far end of the cable and pin 2 is connected to pin 1 at the far end of the cable.

MISWIRED PAIRS

An easy way to see cable miswiring is to visually compare the two ends of the cable. Because the cables are wired identically at each end it is typically easy to view the wire color codes through the transparent RJ45 connector housing. In the example the wires on pins 6 and 7 of the far end have been interchanged (not wired one to one).

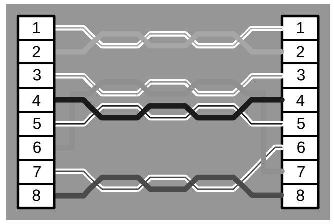

Figure A-5. Incorrectly wired cable (miswire)

OPEN AND SHORTED PAIRS

The simplest types of cable faults to find are open or short circuit pairs. An open circuit is easy to find using a simple continuity test from each pin of one end of the cable to the corresponding pin at the opposite end of the cable.

Shorted pairs can also be found be continuity testing between pins at either end of the cable.

Both of these faults can be caused by miswiring of the cables to the RJ 45 connectors, or by damage to the cable. The most common form of opens and shorts are due to improperly crimped connectors. Be sure to perform a visual and electrical check of each connector as they are terminated.