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PRODUCT REVISION: 1

SS7515

SYNC DOCTOR™ SYNC STABILIZER

COMPUTER VIDEO EQUALIZER

USER'S GUIDE

SYNC STABILIZERS

INTRODUCTION

Altinex appreciates your purchase of the **SS7515** Sync Stabilizer Computer Video Equalizer. We are sure you will find it a reliable and useful product.

Superior performance for the right price backed by solid technical and customer support is what we have to offer.

The product you are holding in your hands is designed using state-of-the-art technology and is superior to anything available on the market. You will find this and our other products reliable, long lasting, and simple to operate.

We are committed to providing our customers with solutions to the most demanding audio-visual installations at very competitive pricing.

We appreciate your selection of our products and are confident that you will join the ranks of our many satisfied customers throughout the world.

This manual covers:

SS7515 Sync Doctor™ - Sync Stabilizer
Computer Video Equalizer

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PRECAUTIONS / SAFETY WARNINGS 1

Please read this manual carefully before using your **SS7515** Sync Doctor™. Keep this manual handy for future reference. These safety instructions are to ensure the long life of your **SS7515** Sync Doctor™ and to prevent fire and shock hazard. Please read them carefully and heed all warnings.

1.1 GENERAL

- Unauthorized personnel shall not open the unit to avoid causing any electrical or mechanical damage.
- Qualified Altinex service personnel, or their authorized representatives must perform all service.

1.2 SAFETY GUIDELINES FOR THE RACK-MOUNTING OF THE SS7515

- Maximum operating ambient temperature is 45 (degrees C).
- Never restrict the airflow through the devices' fan or vents.
- When installing equipment into a rack, distribute the units evenly. Otherwise, hazardous conditions may be created by an uneven weight distribution.
- Connect the unit to a properly rated supply circuit.
- Reliable Earthing (Grounding) of Rack-Mounted Equipment should be maintained.

1.3 INSTALLATION

- For best results, place the **SS7515** on a flat, level surface in a dry area away from dust and moisture.
- To prevent fire or shock, do not expose this unit to rain or moisture. Do not place the **SS7515** Sync Doctor™ in direct sunlight, near heaters or heat radiating appliances, or near any liquid. Exposure to direct sunlight, smoke, or steam can harm internal components.
- Handle the **SS7515** carefully. Dropping or jarring can damage internal components.

- Do not place heavy objects on top of the **SS7515**.
- To turn off the power, disconnect the DC plug from the **SS7515**. The power outlet socket should be installed as near to the equipment as possible, and should be easily accessible in order to plug into the AC/DC adapter.
- Do not pull the adapter or any cable that is attached to the **SS7515**.
- If the **SS7515** is not used for an extended period, disconnect the AC/DC adapter from the power outlet.

1.4 CLEANING

- Unplug the **SS7515** AC/DC adapter before cleaning. Clean surfaces with a dry cloth. Never use strong detergents or solvents, such as alcohol or thinner. Do not use a wet cloth or water to clean the unit.

1.5 FCC / CE NOTICE

- This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.
- This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.
- Any changes or modifications to the unit not expressly approved by Altinex, Inc. could void the user's authority to operate the equipment.

ABOUT YOUR SYNC STABILIZER 2

The **SS7515** Sync Doctor™ is a multi-purpose ground loop isolator, sync stabilizer, sync combiner, and a line driver with a video equalizer designed as a high quality video and audio interface. The **SS7515** allows the connection of RGBHV, RGBS, and RGsB signals to any projector, monitor, or display.

Ground Loop Isolator

In an audio/visual system, when different pieces of equipment operating from different power sources are connected, a ground loop can potentially occur. This ground loop usually causes a hum bar to roll from top to bottom over a display image. Severe ground loops can cause damage to equipment. Operating as a ground loop isolator, the **SS7515** can be installed between the equipment to eliminate a ground loop problem. The common mode range of the **SS7515** Sync Doctor™ is +/-1V with a video signal of 1V p-p.

Sync Stabilizer

The sync stabilization process is necessary for stabilizing vertical and horizontal images on the screen. The stability of the image's position on the screen depends on the quality of sync pulses. When long cables connect horizontal and vertical sync from a PC to monitor, the sync pulses lose their original form as shown in figure 1 below.

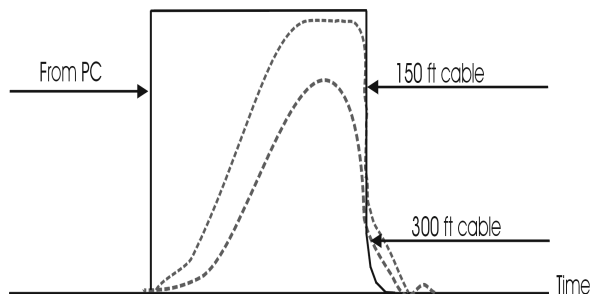


Figure 1: Horizontal or vertical sync changes

These changes in form create variability, making the start frame's timing erratic. This affects the image's stability on the display. To correct image instability, the **SS7515** Sync Doctor™ has a threshold adjustment feature used for selecting

trigger points on horizontal and vertical sync signals to stabilize the image's horizontal and vertical positions. At times, however, the threshold adjustment feature is not effective if the sync channels present high frequency noise. The **SS7515** also offers "sync smoothing" switches for horizontal and vertical sync, which clean up high frequency noise and high frequency distortion. Use "sync smoothing" switches to clean up sync channels from high frequency noise. Select the best position to stabilize images on the screen. After cleaning up sync channels from high frequency noise if the problem is not resolved completely, use the sync trigger threshold adjustment control.

Sync Timing

Some projectors require specific sync pulse widths while certain computers create different sync pulse widths. The **SS7515** can be compatible with any computer monitor or projector by using H & V sync adjustments. The **SS7515** regenerates horizontal sync with an adjustable pulse width of 0.5us to 7us and vertical sync with an adjustable pulse width of 10us to 70us. The **SS7515** offers a variable delay time for adjusting the horizontal position on the screen.

Sync Combining and Splitting

The **SS7515** Sync Doctor™ can combine horizontal and vertical sync into composite sync, as well as split composite sync into separate horizontal and vertical sync. (See dip-switch settings – section 7)

Sync Direct

LCD and DLP projectors are very sensitive to horizontal sync trembling. The Sync Direct function bypasses all shifting circuits and stabilizes sync from the computer. The **SS7515** Sync Doctor™ offers Sync on Green (Sync on Red or Sync on Blue) if requested by the customer.

Video Equalizer

The **SS7515** Sync Doctor™ has sixteen position binary switches for each video channel, which allow the equalization of video signals according to cable lengths. The equalization

SYNC STABILIZERS

process compensates for video signal distortion after long cables are passed through.

TECHNICAL SPECIFICATIONS 3

| FEATURES/DESCRIPTION | SS7515 |
|-----------------------|--------------------------------|
| GENERAL | |
| No. of Inputs | |
| Input Connector | 5 BNC |
| Stereo Audio | 1 (5 conductor Terminal Block) |
| No. of Outputs | |
| RGBHV | 1 (HD, F, 15-pin) |
| Stereo Audio | 1 (5 conductor Terminal Block) |

Table 1. **SS7515** General

| MECHANICAL | SS7515 |
|----------------------|-------------------|
| Material | 0.1" AL |
| Finish | Gray |
| Front/Rear Panel | Lexan |
| Height (inches) | 0.96in (22mm) |
| Width (inches) | 8.50in (216mm) |
| Depth (inches) | 4.40in (112mm) |
| Weight (pounds) | 1.2lb (55kg) |
| Ship Weight (pounds) | 2.4lb (1.1kg) |
| T° Operating | 10°C – 35°C |
| T° Maximum | 50°C |
| Humidity | 90%non-condensing |
| MTBF (calculations) | 43,000 hrs. (min) |

Table 2. **SS7515** Mechanical

| ELECTRICAL | SS7515 |
|--------------------------------|------------------------------|
| Input Audio Signals | |
| Impedance | 10k Ohms |
| Voltage | 3V p-p, +/-1.5V |
| Type | Differential |
| Input Video Signals | |
| RGB Analog Signal Amplitude | 0.3V to 1.2V p-p |
| Input Impedance | 75 Ohms |
| Input Type | Loop isolation, differential |
| Input Sync Signals | |
| Amplitude Level | 0.3V - 5.5V |
| H. Sync Width | 0.5us - 5us |
| V. Sync Width | 7us – 220us |
| Output Audio Signals | |
| Type | Differential |
| Cross-talk | <80dB @ 1kHz |
| Signal-to-noise-ratio | >95dB |
| Bandwidth | 10Hz-40kHz |
| Stereo Channel Separation | >75dB @ 1kHz, >60dB @ 20kHz |
| Output Video Signals | |
| RGB Output Amplitude | 1.2V p-p |
| Output Video Impedance | 75 Ohms |
| Output Sync Signals | |
| Amplitude Level | 4.5 ± 0.5V |
| H. Sync Width | 0.5us – 7us |
| V. Sync Width | 10us – 70us |
| Frequency Compatibility | |
| Horizontal | 15-130 kHz |
| Vertical | 25 – 180 Hz |
| Typical Video Bandwidth | 350 MHz |
| Power | |
| Power Consumption | 4 watts max |

Table 3. **SS7515** Electrical

SS7515 DESCRIPTION

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4.1 VIDEO INPUT (BNC CONNECTORS)

The input on the front panel of the **SS7515** allows the connection of a computer to the Sync Stabilizer using an Altinex high quality VGA cable.

| INPUT SIGNAL ON BNC CONNECTORS | |
|--------------------------------|--------------------------------|
| 1 | Red Video |
| 2 | Green Video |
| 3 | Blue Video |
| 4 | Horizontal Sync/Composite Sync |
| 5 | Vertical Sync |

Table 4. Video Input

4.2 VIDEO OUTPUT (15-PIN HD CONNECTOR)

The output on the rear panel of the **SS7515** allows a connection to different types of projectors or monitors using Altinex cables (see Accessories - Section 8).

| PIN No. | OUTPUT SIGNAL ON 15-PIN HD FEMALE CONNECTOR |
|---------|---------------------------------------------|
| 1 | Red Video |
| 2 | Green Video |
| 3 | Blue Video |
| 4 | Not Used |
| 5 | Not Used |
| 6 | Red Signal Return |
| 7 | Green Signal Return |
| 8 | Blue Signal Return |
| 9 | Composite Sync |
| 10 | Sync Signal Return |
| 11 | Not Used |
| 12 | Not Used |
| 13 | Horizontal Sync |
| 14 | Vertical Sync |
| 15 | Not Used |

Table 5. Video Output

4.3 AUDIO INPUT (5-PIN MALE TERMINAL BLOCK)

The 5-pin terminal block on the front panel of the **SS7515** Sync Doctor™ allows the connection of stereo audio signals from a computer or another audio source.

| PIN No. | INPUT SIGNAL ON 5-PIN MALE TERMINAL BLOCK |
|---------|-------------------------------------------|
| 1 | L+IN (Left Channel) |
| 2 | L-IN (Left Channel) |
| 3 | GROUND |
| 4 | R+IN (Right Channel) |
| 5 | R-IN (Right Channel) |

Table 6. 5-pin Male Terminal Block for Input

4.4 AUDIO OUTPUT (5-PIN MALE TERMINAL BLOCK)

The 5-pin terminal block on the rear panel of the **SS7515** Sync Doctor™ allows the connection of stereo audio signals to any amplifier.

| PIN No. | OUTPUT SIGNAL ON 5-PIN MALE TERMINAL BLOCK |
|---------|--------------------------------------------|
| 1 | L+OUT (Left Channel) |
| 2 | L-OUT (Left Channel) |
| 3 | GROUND |
| 4 | R+OUT (Right Channel) |
| 5 | R-OUT (Right Channel) |

Table 7. 5-pin Male Terminal Block for Output

4.5 POWER INPUT CONNECTOR

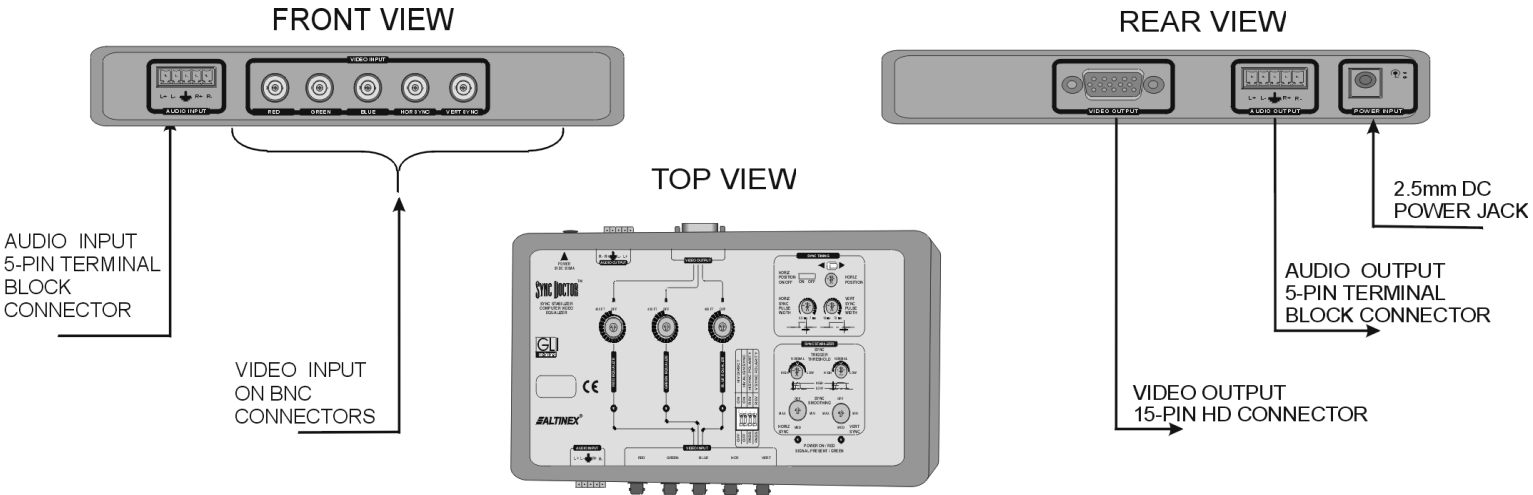
The **SS7515** has a 2.5mm DC power jack for connection to a 9V 500-mA power external adapter.

4.6 BANDWIDTH

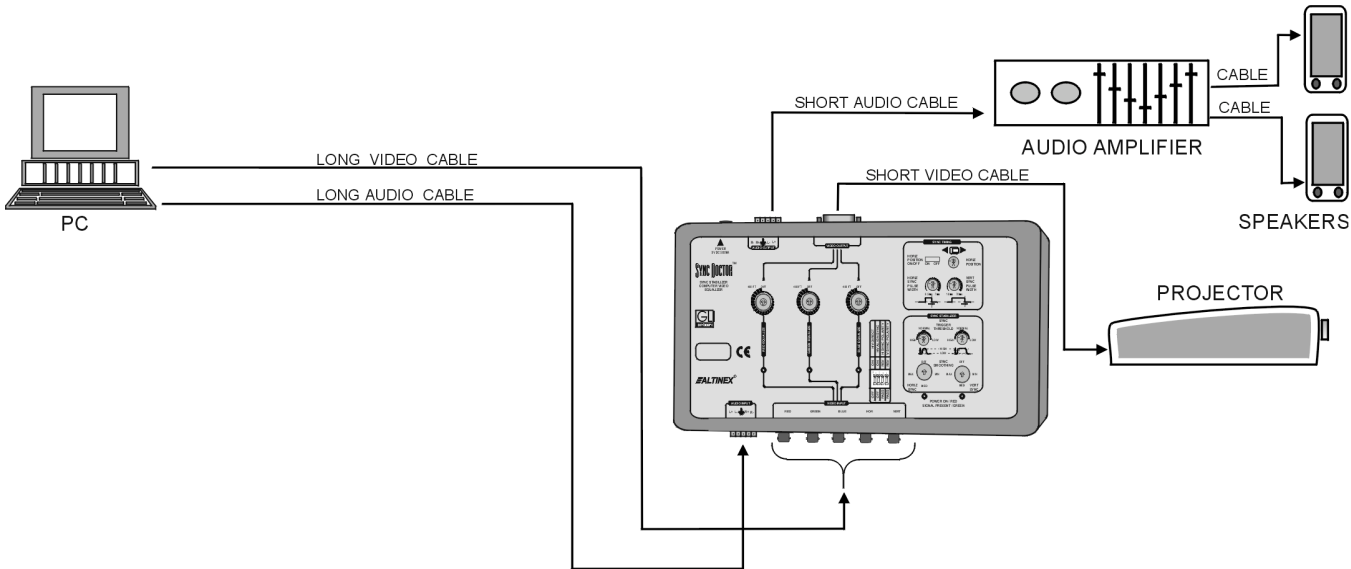
The typical bandwidth of the **SS7515** is 350 MHz. This high bandwidth allows the passing of the third harmonics of the video signal, thus maintaining the highest quality of the input signal.

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SS7515 DESCRIPTION (CON'T)



APPLICATION DIAGRAM 5



INSTALLING YOUR SYNC STABILIZER 6

- Step 1.** Connect the 9V 500mA AC/DC adapter. Put the AC end into the power outlet and the DC end into the **SS7515**'s 2.5mm DC power jack. The H & V LED's should turn red.
- Step 2.** Connect the cable from the RGBHV video source to the BNC input connector. The H&V and the RGB LED's should turn green if horizontal sync, vertical sync, and RGB signals are present. If the video signal is in RGBS format, the LED that represents vertical sync will remain red.
- Step 3.** Connect the audio input cable from the audio source to the terminal block connector.
- Step 4.** Connect the output of the **SS7515** to the input of the projector or monitor. Make sure that the dip-switch setting corresponds to the projector or monitor's input type. Using the dip-switches you may change horizontal and vertical polarity, align vertical sync with horizontal sync or directly pass H and V sync from the input to the output without delay, but maintaining the ability to change the H and V sync width.
- Step 5.** Connect the audio output of the **SS7515** to the audio amplifier.
- Step 6.** Adjust the image on the display screen using the horizontal position control. The Horizontal position control should be in the ON position.
- Step 7.** Verify that the picture quality on the display is good. If the picture quality is not good, adjust the image as described in the Operation – section 7 of the manual.

CONGRATULATIONS! YOU ARE DONE.

If you experience any problems, please call
1-800-258-4623 or 1-714-990-2300 for
international calls.

OPERATION 7

CONTROLS

- Default all dip-switches to the OFF position; Horizontal positioning switch in the ON position
- Horizontal position potentiometer in the center position
- Horizontal sync pulse width potentiometer pointing to the left
- Vertical sync pulse width potentiometer pointing to the left
- Sync trigger threshold potentiometer for horizontal and vertical sync in normal position
- Sync Smoothing switches in the OFF position
- Equalization switches in the zero (0) position

7.1 SYNC TUNING

7.1.1 HORIZONTAL POSITION TUNING

When using a projector or monitor's horizontal position adjustment, it is not possible to move the image to the center of the screen. Use the **SS7515**'s HORIZONTAL POSITION control to move the image to the center of the screen. Make sure that the horizontal position switch of the **SS7515** is in the ON position.

7.1.2 SYNC WIDTH TUNING

If further adjustments to the image are necessary, adjust the display using the appropriate SYNC WIDTH TUNING control: the horizontal sync width and the vertical sync width. When using horizontal sync width, it is possible to change the sync width from 0.5us to 7us. When using vertical sync width, it is possible to change the sync width from 7us to 70us.

7.2 SYNC STABILIZER

7.2.1 SYNC TRIGGER THRESHOLD TUNING

The SYNC TRIGGER THRESHOLD TUNING control is used for selecting trigger points on horizontal and vertical sync signals to stabilize the image's horizontal and vertical positions. If

the image is not stable and there is the presence of horizontal or vertical jitters on the screen, stabilize the image using the SYNC TRIGGER THRESHOLD TUNING control. If SYNC TRIGGER THRESHOLD TUNING does not solve the problem, use the SYNC SMOOTHING switches.

7.2.2 SYNC SMOOTHING

The **SS7515** also offers SYNC SMOOTHING switches for horizontal and vertical sync, which clean up high frequency noise and high frequency distortion. Use the horizontal and vertical SYNC SMOOTHING switches to adjust the image if there are jitters on the screen.

7.3 SIGNAL PRESENT/POWER ON

If power is connected to the unit, LED's that represent the presence of horizontal sync and vertical sync on the input should turn red. When H and V sync is connected to the **SS7515** the LED's should turn green indicating that a signal is present.

7.4 VIDEO EQUALIZER

The **SS7515** Sync Stabilizer has sixteen position binary switches for each video channel, which allow the equalization of video signals according to cable lengths. Verify what cable lengths are connected to the input and output. Each sixteen-position dip-switch approximates an additional 25ft of cable, depending upon the attenuation characteristics of the cable. Turn the Red, Green, and Blue controls to the best position for the image. In typical situations these applications, red, green, and blue switch settings should be in similar positions.

7.5 HORIZONTAL PULSE WIDTH

The ideal setting for the horizontal pulse width of the **SS7515** is 1-2us; however, in some cases the H. Pulse Width should be adjusted. If the screen has a blank picture, increase the H. Pulse Width toward 7us. If there is an incorrect intensity, such as a darkened screen, decrease the H. Pulse Width to correct the black level for some cases where horizontal sync has come too close to the video portion of the signal timing.

7.6 VERTICAL PULSE WIDTH

The ideal setting for the vertical pulse width of the **SS7515** is 60-70us. If there is sync separation, increase the V. Pulse Width to distinguish horizontal and vertical sync when combining the H. Pulse Width and V. Pulse Width. If flagging occurs, decrease the V. Pulse Width to correct one possible cause of "flagging", where the top portion of an image display is curved to one side over several horizontal lines.

7.7 DIP-SWITCHES

7.7.1 HV DIRECT

The **SS7515** combines horizontal and vertical sync into composite sync as well as splits composite sync into separate horizontal and vertical sync. This is known as the regeneration process. The HV DIRECT switch eliminates the regeneration process allowing the original format of the H&V Sync to pass. The timing and stability functions may still be used to clean up H&V. To use horizontal and vertical sync without the regeneration process, turn ON the HV DIRECT switch.

7.7.2 HV ALIGN

If the projector or monitor's sync response is delayed, turn ON the HV ALIGN dip-switch. Use this switch in order to receive a more prompt sync response. This helps prevent vertical image roll, and a blank display.

7.7.3 SYNC POLARITY

Make sure that the horizontal sync polarity or vertical sync polarity is compatible with the monitor. If the sync polarity is not compatible with the monitor, the screen will produce a blank image. Use the H. SYNC POLARITY switch or the V. SYNC POLARITY switch to select the most appropriate sync polarity for the monitor.

SYNC STABILIZERS

ACCESSORIES 8

| Model No. | Description |
|-----------|---------------------------------------------------|
| | HIGH RESOLUTION 5-CHANNEL COAX CABLE |
| CB4200MR | Bulk cable (500 ft. minimum) |
| CB4203MR | 3 feet, 5-BNC to 5-BNC |
| CB4206MR | 6 feet, 5-BNC to 5-BNC |
| CB4212MR | 12 feet, 5-BNC to 5-BNC |
| CB4225MR | 25 feet, 5-BNC to 5-BNC |
| CB4250MR | 50 feet, 5-BNC to 5-BNC |
| CHB4275MR | 75 feet, 5-BNC to 5-BNC |
| CB42100MR | 100 feet, 5-BNC to 5-BNC |
| CB42150MR | 150 feet, 5-BNC to 5-BNC |
| | SUPER HIGH RESOLUTION 5-CHANNEL COAX CABLE |
| CB4400MR | Bulk cable (500 ft. minimum) |
| CB4406MR | 6 feet, 5-BNC to 5-BNC |
| CB4412MR | 12 feet, 5-BNC to 5-BNC |
| CB4425MR | 25 feet, 5-BNC to 5-BNC |
| CB4450MR | 50 feet, 5-BNC to 5-BNC |
| CB4475MR | 75 feet, 5-BNC to 5-BNC |
| CB44100MR | 100 feet, 5-BNC to 5-BNC |
| CB44150MR | 150 feet, 5-BNC to 5-BNC |
| | VGA TO RGB ADAPTER CABLES |
| MS8102CA | 15-pin HD Male to 5-BNC Male, 6 ft |
| MS8104CA | 15-pin HD Male to 5-BNC Male, 15 ft |
| MS8105CA | 15-pin HD Male to 5-BNC Male, 50 ft |
| MS8106CA | 15-pin HD Male to 5-BNC Female, 6 ft |
| MS8112CA | 15-pin HD Female to 5-BNC Male, 6 ft |
| MS8114CA | 15-pin HD Female to 5-BNC Male, 15 ft |
| | POWER SUPPLIES |
| PS5502US | 9V 500mA Power Supply for US |
| PS5512UK | 9V 500mA Power Supply for UK |
| PS5522AU | 9V 500mA Power Supply for Australia |
| PS5532GR | 9V 500mA Power Supply for Germany |
| PS5542JP | 9V 500mA Power Supply for Japan |

FREQUENTLY ASKED QUESTIONS 9

| No: | Question | Answer |
|-----|---------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | What is a SS7515 Sync Doctor™? | A SS7515 Sync Doctor™ is a sophisticated audio-visual device, which acts as a ground loop isolator, sync combiner, sync stabilizer, and a line driver with a video equalizer. |
| 2 | When do I use the SS7515 ? | Often, in large audio/visual systems, several pieces of equipment are powered from multiple AC feeds and are powered from the same feeds that are used to operate high current equipment. This can potentially create a ground loop problem, evidenced by a rolling hum bar on a display or by sync instability. The SS7515 is a high resolution; high bandwidth ground loop isolator designed to resolve these common ground problems in audio/visual systems. If a monitor or projector is connected to the computer by long cables (from 50ft-400ft), video signals lose their original wave form and amplitude. The SS7515 restores horizontal and vertical sync parameters and regenerates sync signals to the appropriate format that is compatible with the monitor or projector. The SS7515 allows the restoration of video signals by using the Equalization switches for Red, Green, and Blue channels. |
| 3 | May I use the SS7515 as | Yes, the SS7515 acts as a sync combiner, allowing you to combine horizontal and |

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| | | |
|---|----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | a sync combiner? | vertical sync into composite sync or splitting composite sync into separate horizontal and vertical sync. The SS7515 is not designed to strip sync from green. |
| 4 | Which signals can pass through the SS7515 ? | The SS7515 can pass RGBHV, RG¾B, RGSB, and also balanced and unbalanced stereo audio signals. |

TROUBLESHOOTING GUIDE

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We have carefully tested and have found no problems in the supplied **SS7515** unit; however, we would like to offer the following suggestions:

- Please make sure that the input amplitude of the analog video signal is less than 1.5V and the audio signal is less than 1V p-p.
- Make sure to use the correct power adapter for the country in which it is being used.
- If the image quality is poor after the tune up procedure has been followed, verify that high quality cables are used. Make sure that the cables used for input and output are of coaxial type with proper impedance. Also, check to see if the pins of the connector are in good condition. We recommend Altinex made cables for best results.
- If a problem arises after continuous usage at higher voltage, higher temperature, higher humidity, or other extreme conditions, please correct the problem.
- Make sure that the video output signal formats are appropriate for display.

11.1 LIMITED WARRANTY

Altinex warrants that its products and cables are free from defects in materials under normal use and service. This warranty is limited to repairing at company's factory any part or parts of the product, which upon company's examination shall disclose to be, thus defective. Products considered defective should be returned to company with transportation charges pre-paid within 2 years (90 days for cables) from date of shipment to the purchaser. The warranty is expressly instead of all other warranties expressed or implied. Altinex neither assumes nor authorizes any other person to assume for it any other liability in connection with the sale of the products. This warranty shall not apply to any product that shall have been repaired or altered outside of company's factory in any way so as, in its judgment, to affect its stability or reliability, or that has been subject to misuse, negligence, or accident.

11.2 RETURN POLICY

It is very important to Altinex that you receive the products that you have ordered and that this product meets your expectations. In the unlikely event that an Altinex product needs to be returned, please follow the policies below:

Altinex will accept product returns for a period of 30 days from authorized Altinex dealers. Products should be returned in an unopened package.

If a product has been opened, the restocking fees will apply. For the restocking fee amount, please contact an Altinex Sales Representative.

If the product is in your possession for more than 30 days, the restocking fees will apply.

Altinex will not accept any returns on cables or custom products.

If your product is in warranty and needs service, contact the Altinex Sales Department for an RMA (Return Material Authorization). Products returned without an RMA number may experience a delay in service.

If your product is out of warranty and needs service, contact the Altinex Sales Department for an RMA (Return Material Authorization). Products returned without an RMA number may experience a delay in service. The service charges will be quoted to you before the actual repairs are done.

11.3 CONTACT INFORMATION

Sales Department

Phone: 714-990-2300

Fax: 714-990-3303

Accounting Department

Phone: 714-990-6088

Fax: 714-990-5778