

DFR-8110A(-C)
Digital Products Frame and Power Supply (PS-8102)
User Manual



DFR-8110A(-C) • Digital Products Frame and Power Supply (PS-8102) User Manual

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Important Regulatory and Safety Notices

Before using this product and any associated equipment, refer to the “**Important Safety Instructions**” listed below to avoid personnel injury and to prevent product damage.

Products may require specific equipment, and/or installation procedures to be carried out to satisfy certain regulatory compliance requirements. Notices have been included in this publication to call attention to these specific requirements.

Symbol Meanings



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product. Failure to heed this information may present a risk of damage or injury to persons or equipment.



Warning — *The symbol with the word “**Warning**” within the equipment manual indicates a potentially hazardous situation, which if not avoided, could result in death or serious injury.*



Caution — *The symbol with the word “**Caution**” within the equipment manual indicates a potentially hazardous situation, which if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.*



Notice — *The symbol with the word “**Notice**” within the equipment manual indicates a situation, which if not avoided, may result in major or minor equipment damage or a situation, which could place the equipment in a non-compliant operating state.*



Warning Hazardous Voltages — *The lightning flash with arrowhead symbol within an equilateral triangle is intended to alert the user to the presence of uninsulated “dangerous voltage” within the product’s enclosure that may be of sufficient magnitude to constitute a risk of shock to persons.*



ESD Susceptibility — *This symbol is used to alert the user that an electrical or electronic device or assembly is susceptible to damage from an ESD event.*

Important Safety Instructions

1. Read these instructions
2. Follow all instructions and heed all warnings.
3. Refer all servicing to qualified service personnel.
4. The equipment’s AC appliance inlets are the means to disconnect the product from the AC Mains and must remain readily operable for this purpose.
5. Parts of the equipment’s power supplies can still present a safety hazard even with the product is in the “OFF” state. To avoid the risk of electrical shock and to completely disconnect the apparatus from the AC Mains, remove all power supply cords from the product’s AC appliance inlets prior to servicing.

6. The product chassis is to be rack mounted only. To ensure safe operation and maintain long-term system reliability, proper installation requires that the front and back area of the chassis remain clear of obstructions so as not to restrict airflow.



Indoor Use: Warning — *To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture.*

EMC Notices

United States of America FCC Part 15

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.



Notice — *Changes or modifications to this equipment not expressly approved by Ross Video Limited could void the user's authority to operate this equipment.*

CANADA

This Class "A" digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe "A" est conforme à la norme NMB-003 du Canada.

EUROPE

This equipment is in compliance with the essential requirements and other relevant provisions of **CE Directive 93/68/EEC**.

INTERNATIONAL

This equipment has been tested to **CISPR 22:1997** along with amendments **A1:2000** and **A2:2002**, and found to comply with the limits for a Class A Digital device.



Notice — *This is a Class A product. In domestic environments, this product may cause radio interference, in which case the user may have to take adequate measures.*

Maintenance/User Serviceable Parts

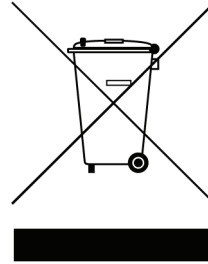
Routine maintenance to this RossGear product is not required. This product contains no user serviceable parts. If the module does not appear to be working properly, please contact Technical Support using the numbers listed under the "Contact Us" section on the last page of this manual. All RossGear products are covered by a generous 5-year warranty and will be repaired without charge for materials or labor within this period. See the "Warranty and Repair Policy" section in this manual for details.

Environmental Information

The equipment that you purchased required the extraction and use of natural resources for its production. It may contain hazardous substances that could impact health and the environment.

To avoid the potential release of those substances into the environment and to diminish the need for the extraction of natural resources, Ross Video encourages you to use the appropriate take-back systems. These systems will reuse or recycle most of the materials from your end-of-life equipment in an environmentally friendly and health conscious manner.

The crossed-out wheeled bin symbol invites you to use these systems.



If you need more information on the collection, reuse, and recycling systems, please contact your local or regional waste administration. You can also contact Ross Video for more information on the environmental performances of our products.

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Introduction

In This Chapter

This chapter contains the following sections:

- Overview
- Documentation Terms and Conventions

A Word of Thanks

Congratulations on choosing the RossGear DFR-8110A(-C) Digital Products Frame and Power Supply. Your DFR-8110A(-C) is part of a full line of Digital Products within the RossGear Terminal Equipment family of products, backed by Ross Video's experience in engineering and design expertise since 1974.

You will be pleased at how easily your new DFR-8110A(-C) fits into your overall working environment. Equally pleasing is the product quality, reliability and functionality. Thank you for joining the group of worldwide satisfied Ross Video customers!

Should you have a question pertaining to the installation or operation of your DFR-8110A(-C), please contact us at the numbers listed on the back cover of this manual. Our technical support staff is always available for consultation, training, or service.

Overview

The DFR-8110A(-C) Digital Products Frame accommodates up to ten Ross 8000 series Distribution Products or ten Leitch® 6800 series video products. For high power consumption requirements, the DFR-8110A can be field upgraded with the CFM-8110A Cooling Fan Module, which is mounted on the inside of the door. Alternatively, the DFR-8110A-C version comes direct from the factory with the cooling fan option already installed. The DFR-8110A(-C) design offers several key features such as; heavy-duty door hinges, durable powder-coat paint finish, and a specially designed top cover to enable frame stacking in high density environments.

The DFR-8110A(-C) carries forward the heritage of our past digital frames by featuring our unique Master Reference Input, which accepts one external analog color black signal that is distributed to all modules. The frame also employs rugged aluminum construction, which provides superb heat dissipation, as well as the use of the highest quality connectors throughout the product.

The PS-8102 universal power supply is a power factor corrected supply that will accommodate all world standards (100-240 volts) with up to 80 Watts of module power. Of special note is that the PS-8102 has the ability to sustain a 100ms input voltage loss, or glitch, while maintaining a full power output. This is of great importance in areas where incoming power may not be clean.



Note — *It is recommended, for long-term reliability and increased product life span, that total dissipation of all modules installed in a 2RU frame should not exceed 40 Watts total without the use of the Cooling Fan Module. Refer to the section “**Ventilation and Cooling**” on page 2-4 for details.*

Features

The following features make the DFR-8110A(-C) one of the finest digital products frames on the market today:

- Each frame accommodates 10 modules in 2RU
- Heavy duty door hinges
- Durable powder-coat paint finish
- Aluminum construction for increased heat dissipation and weight reduction
- Master Reference Input feeds all module slots
- Power Switch is accessible from front of the rack frame
- Universal Power Supply (PS-8102) for all world standards (100-240 volts)
- PS-8102 sustains a 100ms incoming power glitch while maintaining full output power
- Power factor corrected supply with power fail detection circuit
- PowerLock cord retainer mechanism guards against accidental power loss
- Separate power cords for each supply for power redundancy
- Optional redundant power supply (PS-8102)
- Optional Cooling Fan Module for increased ventilation
- Fan Fail and Error Indicator LED's on front of the frame (available with CFM-8110A)
- Optional Extender Board Module for servicing
- Optional Cable Support Bracket
- Optional Frame Support Brackets
- 5-year transferable warranty
- Also accepts Leitch 6800 series video products

Documentation Terms and Conventions

The following terms and conventions are used throughout this manual:

- “**Frame**” refers to the DFR-8110A(-C) frames that house the cards.
- “**DFR-8110A**” refers to the frame without the CFM-8110A Cooling Fan Module.
- “**DFR-8110A-C**” refers to the frame with the CFM-8110A Cooling Fan Module.
- “**DFR-8110A(-C)**” refers to all versions of the frame unless otherwise noted.
- “**Operator**” and “**User**” refer to the person who uses DFR-8110A(-C).
- “**Board**”, and “**Card**” refer to RossGear terminal device(s) within the frame, including all components and switches.
- “**System**” and “**Video system**” refer to the mix of interconnected production and terminal equipment in your environment.
- The “**Operating Tips**” and “**Note**” boxes are used throughout this manual to provide additional user information.

Installation

In This Chapter

This chapter provides instructions for installing the DFR-8110A(-C), and cabling details.

The following topics are discussed:

- Before You Begin
- Installing the DFR-8110A(-C)
- Cabling for the DFR-8110A(-C)

Before You Begin

Review the following information before proceeding with the instructions in this chapter.

Static Discharge

Throughout this chapter, please heed the following cautionary note:



ESD Susceptibility — *Static discharge can cause serious damage to sensitive semiconductor devices. Avoid handling circuit boards in high static environments such as carpeted areas and when synthetic fiber clothing is worn. Always exercise proper grounding precautions when working on circuit boards and related equipment.*

Unpacking

Unpack each DFR-8110A(-C) you received from the shipping container and ensure that all items are included. If any items are missing or damaged, contact your sales representative or Ross Video directly.

Installing the DFR-8110A(-C)

This section outlines how to install the DFR-8110A(-C).

Mechanical Overview

The frame mounts in the rack cabinet by means of four rack screws fastened through the front mounting flanges. This should normally be sufficient to carry the load, including the weight of accompanying cables. However, in certain applications such as mobile truck installations, it may be desirable to also support the rear of the frame. Ross Video has specifically engineered the optional FSB-7110 Rear Support Bars and Brackets to compensate for extra load stress. Refer to the section “**Support Bars and Brackets**” on page 3-4 for detailed installation instructions.

Power Supply (PS-8102) and Power Cable

The DFR-8110A(-C) comes standard with one PS-8102 power supply, with a second optional supply available for redundancy. For redundancy, and in applications where the equipment is used in a critical signal path, we recommend that two power supplies be used in the DFR-8110A(-C) frame. One power cable has been provided with each power supply ordered.

For further redundancy, each power cord should be connected to a separate power source for protection against failure of the supply or power. Reliability will also be improved when using redundant supplies as each supply shares the load. In the event of one power supply failure, module power is seamlessly transferred to the other, redundant supply. Although the power supply is “hot-swappable,” turning the power supply off, before inserting or removing it from the frame, will increase the life span of connectors.

Of great importance to the user who may have unstable or unpredictable facility power, is the ability of the PS-8102 to withstand input power glitches of up to 100ms in length, while still providing uninterrupted power to the modules in the frame. This is an essential feature for applications such as program feeds, live event feeds, or wherever a robust signal system is required. The ability of the PS-8102 to withstand input power glitches is increased with the use of redundant supplies.

The PS-8102 is a power factor corrected supply, capable of working with all world standards (100-240V). The supply has an error detection circuit that will indicate the following conditions:

Table 2.1 PS-8102 Error Detection Circuit Conditions

Condition	Indication
Light load (< 2 Watts)	Red LED flashes
Blown O/P fuse	Red LED lit
Short circuit (internal) ^a	Red LED flashes
Short circuit (external)	• Red LED lit • Fuse blows on O/P of supply
Normal conditions load: 2 Watts to 40 Watts (Recommended load > 2 Watts)	Green LED lit

- a. If the power is turned on with a “short” condition in the frame or one of the modules, the power supply will go into a startup and shutdown sequence until the “short” is removed.

Installing the Frame Power Supply

The power supply tray plugs into the right-hand section of the chassis. The supply is universal, and no power adjustments are required.



Warning Hazardous Voltages — *The safe operation of this product requires that a protective earth connection be provided. This protective earth is provided by the grounding conductor in the equipment's supply cord. To reduce the risk of electrical shock to the operator and service personnel, this ground connector must be connected to an earthed ground.*

Use the following procedure to install the power supply:

1. Carefully unpack the power supply from its box, and retain all packing material for future use, if required.
2. Align the card-edge on the top and bottom of the supply with the slots in the chassis.
3. Push the power supply in firmly to ensure a tight connection at the rear of the frame.

This completes the procedure for installing the power supply.

Fault Reporting

The error conditions listed in **Table 2.1** will trigger the SMPTE 269M fault reporting circuit, and the signal will be sent to Aux A on the back of the frame. Refer to the section “**Aux A Connector**” on page 2-6 for details.

Improving Performance

To improve performance and reliability, the PS-8102 has an on-board fan. For even better reliability, and high load conditions (>40 Watts), we recommend the use of the CFM-8110A Cooling Fan Module.

Ventilation and Cooling

This frame has been specially engineered to minimize internal heat buildup and thus improve module reliability. However, for long-term reliability and increased product life of the DFR-8110A, it is recommended that the total power dissipation of all modules installed should not exceed 40 Watts, and to leave an empty 1RU panel space above and below the frame for improved heat dissipation. For information on the power requirements of RossGear modules, please refer to the Ross Video Product Catalog or visit our website.

It is also recommended for applications using less than 40 Watts in a non-ventilated frame, but where the individual module power consumption is greater than 8 Watts, that the cards be evenly distributed in the frame. This measure will prevent the creation of concentrated heat, or unbalanced heat-rise areas, in the frame.

For applications that require greater heat dissipation, or where the module power consumption is greater than 40 Watts, we recommend the use of the DFR-8110A-C, or installation of the CFM-8110A Cooling Fan Module in a DFR-8110A, field upgrade option. When the Cooling Fan Module is installed, the frame and PS-8102 can supply up to 80 Watts of module power. Under these ventilated conditions, there is no requirement for extra spacing between the frames. The DFR-8110A-C (or DFR-8110A with CFM-8110A option) can be stacked one on top of the other, a feature that is highly desirable in densely crowded rack frame environments.



Notice — For reliable performance, it is recommended that the frame door not be opened for longer than 5 minutes when using the Cooling Fan Module option, on frames loaded with more than 40 Watts.

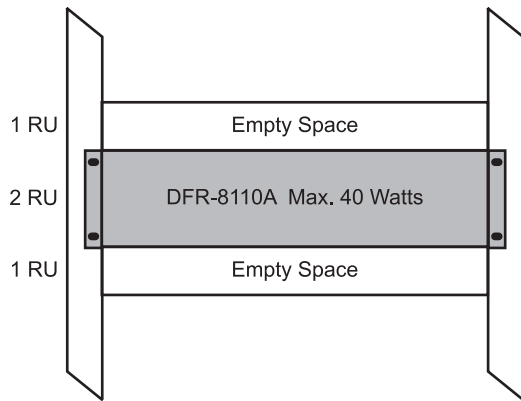


Figure 2.1 Frame Stacking — CFM-8110A Not Installed

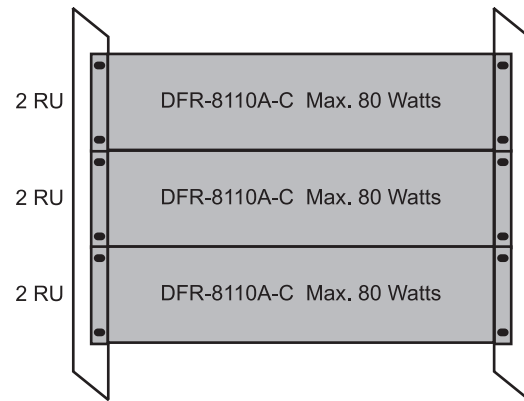


Figure 2.2 Frame Stacking — CFM-8110A Installed

Cabling for the DFR-8110A(-C)

This section provides information for connecting cables to the DFR-8110A(-C).

Cabling Overview

The frame BNC connectors have been marked as inputs and outputs. In some cases, the connectors will have been assigned a different function. Consult the installation section of each module, or BNC designations screened on the card, for a translation table, if required.

The inputs are internally terminated in 75 ohms.

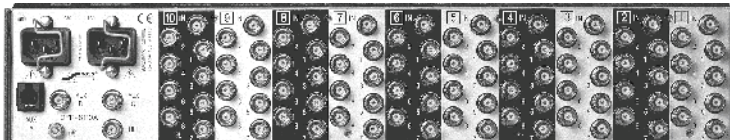


Figure 2.3 DFR-8110A(-C) and DFR-8110A(-C)-C Rear Panel View

Aux A Connector

The Aux A telco connector may be wired to an external alarm system for reporting alarms in SMPTE 269M format. For more details on this type of system, refer to the document *ANSI/SMPTE 269M - 1994*, available from SMPTE.

Some modules have provision for reporting signal loss and certain other fault conditions. All such cards in the frame connect to an opto-isolator circuit in the frame.

For example, in the case of the SRA-8001A Serial Auto-Reclocking Amplifier, if the input signal is lost or low, the INPUT STATUS Red LED will be lit. If the FAULT REPORT jumper is in the ENABLE position, then there will be a pulsed contact closure on the telco connector for as long as the error condition continues. The output circuit will be closed for about 1-2 milliseconds, repeated approximately every 17 milliseconds. In the absence of a fault, the output will remain open.

The circuit can drive a 20mA alarm load.

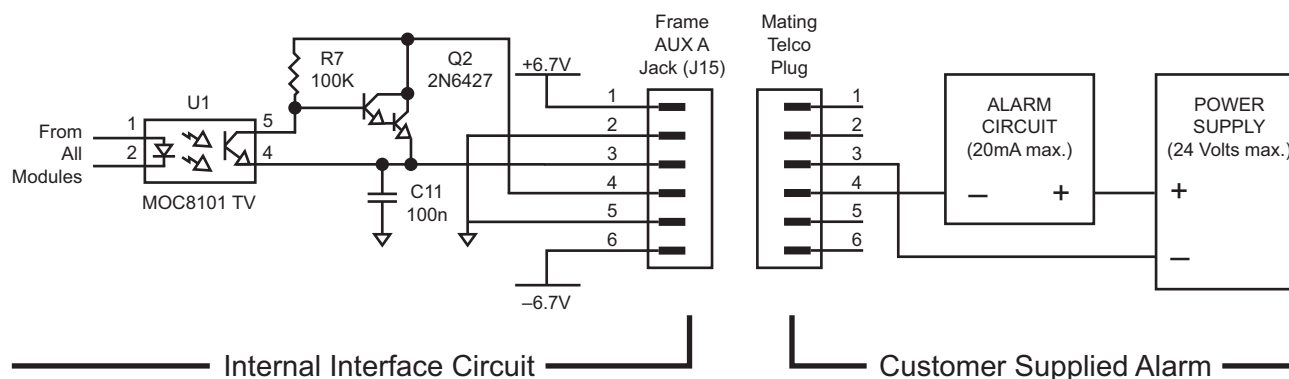


Figure 2.4 SMPTE 269M Alarm Reporting Internal Interface and Typical Connections

Aux B Connector

This BNC connector is used to relay data to an external monitoring system. Serial data communication is used. Only modules having this capability will use this system.

Aux C Connector

Reserved for future use.

Reference Connector

This feature, developed and brought to market by Ross Video, uses a BNC connector to input an external master frame REF signal that is distributed across the back plane to all modules. Typically analog black video is used. Some cards, which need an external reference, can use this “master” reference signal in place of taking the signal from one of the module BNC. This provides for ease of installation and reduction in reference cabling requirements. If this signal is required, it will be mentioned in the Installation section of the particular card User Manual.

Optional Field Upgrade Kits

In This Chapter

This chapter contains the following sections:

- CFM-8110A Cooling Fan Overview
- CRB-8110A Card Retaining Bracket
- Support Bars and Brackets

CFM-8110A Cooling Fan Overview

The standard equipment, DFR-8110A, can be also be ordered as the DFR-8110A-C version, with the Cooling Fan Module installed as original equipment from the factory. However, for customers wishing to increase the ventilation on their standard DFR-8110A frames, the optional CFM-8110A Cooling Fan Module is available as a field upgrade kit

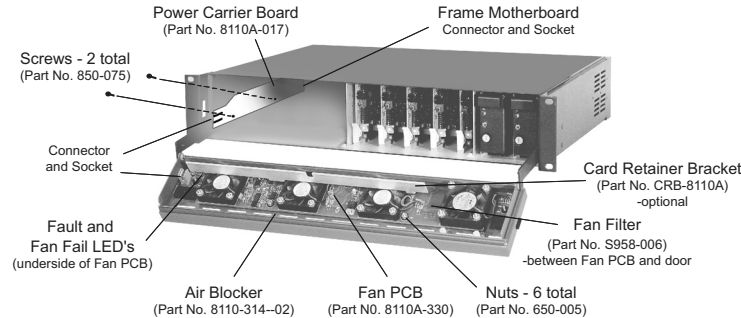


Figure 3.1 CFM-8110A Cooling Fan Module

Installing the CFM-8110A

Use the following procedure to install the CFM-8110A in a DFR-8110A:

1. Insert the Power Carrier Board (8110A-017) into the Frame Motherboard on the left-hand inside rear by ensuring all six pins, or three connectors, are properly aligned, and carefully fit into the sockets.
 - It is helpful to straighten the pins if they have been bent during shipping and handling, and to remove any modules from the frame that would interfere with easy access and lines of sight.
2. Secure the Power Carrier Board to the side of the frame by inserting the two Screws (850-075) provided, from the left side of the frame exterior. In mobile applications, secure screws with Loctite.
3. Remove the protective film from both sides of the clear plastic Air Blocker (8110-314-01), and install it onto the door using the two Nuts (650-005) provided.
4. Place the Fan Filter (S958-006) onto the door
5. Install the Fan PCB (8110A-330) on the door, ensure that alignment of the Fault and Fan Fail LED's is correct, and secure it with the four Nuts (650-005) provided.
6. Close the door and check the operation of the fans.
 - If the fans do not operate, verify that the Power Carrier Board seats properly in the Frame Motherboard, and is aligned to the Fan PCB when the door is closed.

This completes the procedure for installing the CFM-8110A in a DFR-8110A.

CRB-8110A Card Retaining Bracket

The CRB-8100A (8110A-312) is useful in mobile applications to prevent frame movement from un-seating the modules. It may be installed in both the DFR-8110A and the DFR-8110A-C.

Installing the CRB-8110A

Use the following procedure to install the CRB-8100A:

1. Install two plastic spacers on the threaded studs near bottom of the door. (**Figure 3.2**)

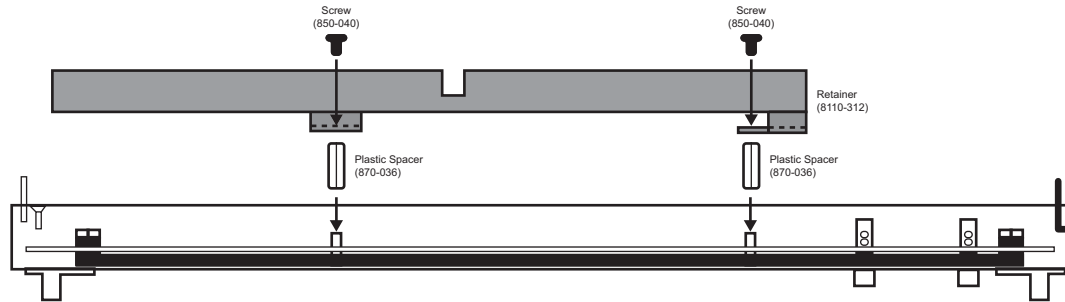


Figure 3.2 CRB-8110A Installation

2. Mount the spacers to the door lower studs (through the PCB if the fan option is installed).
3. Mount the Retainer to the stand-offs with screws.
4. Attach the bracket to the plastic spacers with the 850-040 screws. (**Figure 3.2**)

This completes the procedure for installing the CRB-8100A.

Support Bars and Brackets

This section provides information on installing the FSB-7110 and CSB-8100 options.



Note — You cannot install the FSB-7110 and CSB-8100 in the same frame.

Installing the FSB-7110 Rear Support Bars and Brackets

Under normal conditions, mounting the frame to the front of the rack with the four rack screws provided, should be sufficient to carry the load, including the weight of accompanying cables. However, Ross Video has specifically engineered the optional FSB-7110 Rear Support Bars and Brackets to compensate for extra load stress associated with certain applications, such as mobile truck installations, to also support the rear of the frame

The rear support bars can be attached to the DFR-8110A(-C) in six possible positions. (**Figure 3.3**)

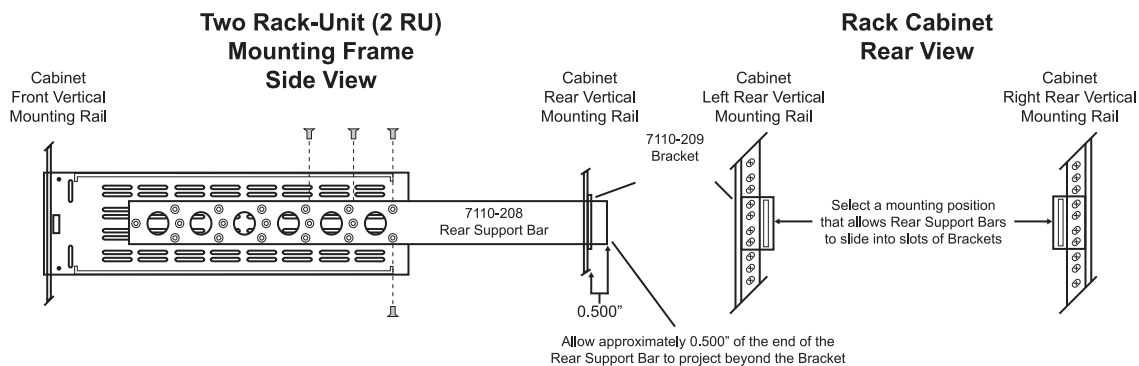


Figure 3.3 FSB-7110 Rear Support Bars and Brackets

Use the following procedure to install the FSB-7110 for the DFR-8110A(-C):

1. Choose the position that suits the cabinet depth and will give approximately $\frac{1}{2}$ inch projection beyond the rear vertical mounting rails.
2. Using four screws per bar, as shown in **Figure 3.3**, fasten one bar to each side of the DFR-8110A(-C).
3. Mount the DFR-8110A(-C) to the front rails of the rack cabinet using four rack screws fastened through the front mounting flanges.
4. At the rear of the cabinet:
 - Slide the bracket slots over the rear of the support bars
 - Secure to the cabinet rear rails with two rack screws each.

This completes the procedure for installing the FSB-7110 for the DFR-8110A(-C).

Installing the CSB-8110A Cable Support Bracket

This bracket, which is specially designed to support the weight of cables connected to the RossGEAR 8000 series digital frames, prevents strain on the BNC connectors. It attaches to the frame sides by screws, and extends beyond the frame rear where cables are tied to it.

Specifications

In This Chapter

This chapter provides the technical specification information for the DFR-8110A(-C).

The following topics are discussed:

- Technical Specifications

Technical Specifications

This section provides the technical specifications for the DFR-8110A(-C).

Table 4.1 DFR-8110A(-C) Technical Specifications

Category	Parameter	Specification
Power Supply	Input Voltage	100-240VAC, 50-60Hz
	Input Power (2RU DFR-8110A)	130W
	Output Voltage	6.7V
	Output Current	The sum of both outputs not to exceed 13A.
	Line Regulation change-over full input range	<250mV
	Output Ripple	<60mV p-p (1.8%)
For safety reasons, Ross Video power supplies do not fit into rack frames of other manufacturers.		
Rack Frame Mechanical	Height	3.5" (90mm)
	Width	19" (483mm)
	Depth	13" (330mm)
	Weight, with 10 cards installed	approx. 13lbs (5.9kg)
Frame Card Slots	Number of Slots	10
	Total Frame Card Power	80W, total card power. Consumption not to exceed 10W maximum per card slot up to frame maximum.
Environmental	Ambient temperature range	0°C to 35°C
	Humidity, non condensing	<95%
Total Module Power	2RU Frame non-ventilated (DFR-8110A)	40W
	2RU Frame ventilated (DFR-8110A-C)	80W

Important Notes

- The power requirement of each product installed in this frame is indicated in the **Specifications** section of the documentation provided with each card.
- For long-term reliability and increased product life, it is recommended that the total dissipation of all modules installed in a frame should not exceed 40W total.
- One rack unit of empty space should be provided above and below each frame for ventilation. Refer to the section “**Ventilation and Cooling**” on page 2-4 for further information and options for higher load applications requiring greater heat dissipation.

Service Information

In This Chapter

This chapter contains the following sections:

- Troubleshooting Checklist
- Warranty and Repair Policy

Troubleshooting Checklist

Routine maintenance to this RossGear product is not required. In the event of problems with your DFR-8110A(-C), the following basic troubleshooting checklist may help identify the source of the problem. If the frame still does not appear to be working properly after checking all possible causes, please contact your RossGear products distributor, or the Technical Support department at the numbers listed under the “**Contact Us**” section.

1. **Visual Review** — Performing a quick visual check may reveal many problems, such as connectors not properly seated or loose cables. Check the card, the frame, and any associated peripheral equipment for signs of trouble.
2. **Power Check** — Check the power indicator LED on the distribution frame front panel for the presence of power. If the power LED is not illuminated, verify that the power cable is connected to a power source and that power is available at the power main. Confirm that the power supplies are fully seated in their slots. If the power LED is still not illuminated, replace the power supply with one that is verified to work.
3. **Input Signal Status** — Verify that source equipment is operating correctly and that a valid signal is being supplied.
4. **Output Signal Path** — Verify that destination equipment is operating correctly and receiving a valid signal.
5. **Unit Exchange** — Exchanging a suspect unit with a unit that is known to be working correctly is an efficient method for localizing problems to individual units.

Warranty and Repair Policy

The RossGear DFR-8110A(-C) is warranted to be free of any defect with respect to performance, quality, reliability, and workmanship for a period of FIVE (5) years from the date of shipment from our factory. In the event that your RossGear DFR-8110A(-C) proves to be defective in any way during this warranty period, Ross Video Limited reserves the right to repair or replace this piece of equipment with a unit of equal or superior performance characteristics.

Should you find that this RossGear DFR-8110A(-C) has failed after your warranty period has expired, we will repair your defective product should suitable replacement components be available. You, the owner, will bear any labor and/or part costs incurred in the repair or refurbishment of said equipment beyond the FIVE (5) year warranty period.

In no event shall Ross Video Limited be liable for direct, indirect, special, incidental, or consequential damages (including loss of profits) incurred by the use of this product. Implied warranties are expressly limited to the duration of this warranty.

This RossGear DFR-8110A(-C) User Manual provides all pertinent information for the safe installation and operation of your RossGear Product. Ross Video policy dictates that all repairs to the RossGear DFR-8110A(-C) are to be conducted only by an authorized Ross Video Limited factory representative. Therefore, any unauthorized attempt to repair this product, by anyone other than an authorized Ross Video Limited factory representative, will automatically void the warranty. Please contact Ross Video Technical Support for more information.

In Case of Problems

Should any problem arise with your RossGear DFR-8110A(-C), please contact the Ross Video Technical Support Department. (Contact information is supplied at the end of this publication.)

A Return Material Authorization number (RMA) will be issued to you, as well as specific shipping instructions, should you wish our factory to repair your RossGear DFR-8110A(-C). If required, a temporary replacement module will be made available at a nominal charge. Any shipping costs incurred will be the responsibility of you, the customer. All products shipped to you from Ross Video Limited will be shipped collect.

The Ross Video Technical Support Department will continue to provide advice on any product manufactured by Ross Video Limited, beyond the warranty period without charge, for the life of the equipment.

Notes:

Notes:

Contact Us

Contact our friendly and professional support representatives for the following:

- Name and address of your local dealer
- Product information and pricing
- Technical support
- Upcoming trade show information

PHONE	General Business Office and Technical Support	613 • 652 • 4886
	After Hours Emergency	613 • 349 • 0006
	Fax	613 • 652 • 4425
E-MAIL	General Information	solutions@rossvideo.com
	Technical Support	techsupport@rossvideo.com
POSTAL SERVICE	Ross Video Limited	8 John Street, Iroquois, Ontario, Canada K0E 1K0
	Ross Video Incorporated	P.O. Box 880, Ogdensburg, New York, USA 13669-0880

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