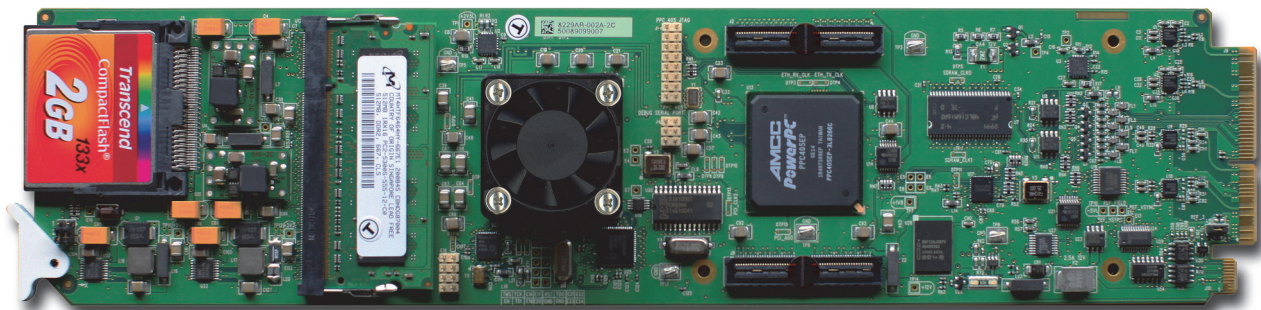


MDK-111A-K

HD/SD Quad Logo Inserter User Manual



Thank you for choosing Ross

You've made a great choice. We expect you will be very happy with your purchase of Ross Technology.

Our mission is to:

1. Provide a Superior Customer Experience
 - offer the best product quality and support
2. Make Cool Practical Technology
 - develop great products that customers love

Ross has become well known for the Ross Video Code of Ethics. It guides our interactions and empowers our employees. I hope you enjoy reading it below.

If anything at all with your Ross experience does not live up to your expectations be sure to reach out to us at solutions@rossvideo.com.



David Ross
CEO, Ross Video
dross@rossvideo.com

Ross Video Code of Ethics

Any company is the sum total of the people that make things happen. At Ross, our employees are a special group. Our employees truly care about doing a great job and delivering a high quality customer experience every day. This code of ethics hangs on the wall of all Ross Video locations to guide our behavior:

1. We will always act in our customers' best interest.
2. We will do our best to understand our customers' requirements.
3. We will not ship crap.
4. We will be great to work with.
5. We will do something extra for our customers, as an apology, when something big goes wrong and it's our fault.
6. We will keep our promises.
7. We will treat the competition with respect.
8. We will cooperate with and help other friendly companies.
9. We will go above and beyond in times of crisis. *If there's no one to authorize the required action in times of company or customer crisis - do what you know in your heart is right. (You may rent helicopters if necessary.)*

MDK-111A-K User Manual

- Ross Part Number: 111AKDR-004-01
- Release Date: November 19, 2014.

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Patents

Patent numbers US 7,034,886; US 7,508,455; US 7,602,446; US 7,802,802 B2; US 7,834,886; US 7,914,332; US 8,307,284; US 8,407,374 B2; US 8,499,019 B2; US 8,519,949 B2; US 8,743,292 B2; GB 2,419,119 B; GB 2,447,380 B; and other patents pending.

Important Regulatory and Safety Notices to Service Personnel

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.

Product 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



This symbol on the equipment refers you to important operating and maintenance (servicing) instructions within the Product Manual Documentation. Failure to heed this information may present a major risk of damage 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 potentially hazardous 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.*



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



Caution — *This product is intended to be a component product of the DFR-8300 series and OG3-FR series frame. Refer to the DFR-8300 and OG3-FR Series Frame User Manual for important safety instructions regarding the proper installation and safe operation of the frame as well as its component products.*



Warning — *Certain parts of this equipment namely the power supply area still present a safety hazard, with the power switch in the OFF position. To avoid electrical shock, disconnect all A/C power cords from the chassis’ rear appliance connectors before servicing this area.*



Warning — *Service barriers within this product are intended to protect the operator and service personnel from hazardous voltages. For continued safety, replace all barriers after any servicing.*
This product contains safety critical parts, which if incorrectly replaced may present a risk of fire or electrical shock. Components contained within the product’s power supplies and power supply area, are not intended to be customer serviced and should be returned to the factory for repair. To reduce the risk of fire, replacement fuses must be the same time and rating. Only use attachments/accessories specified by the manufacturer.



Warning — *This product includes an “Ethernet Port” which allows this product to be connected to a local area network (LAN). Only connect to networks that remain inside the building. Do not connect to networks that go outside the building.*

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 their 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 a 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

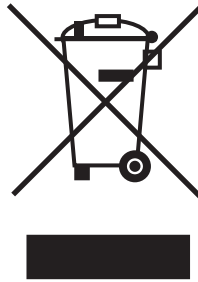
Routine maintenance to this openGear product is not required. This product contains no user serviceable parts. If the module does not appear to be working properly, please contact Technical Support using the numbers listed under the “Contact Us” section on the last page of this manual. All openGear products 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 wheelie bin symbol invites you to use these systems.



If you need more information on the collection, re-use, and recycling systems, please contact your local or regional waste administration.

You can also contact Ross Video for more information on the environmental performance of our products.

Company Address



Ross Video Limited

8 John Street
Iroquois, Ontario, K0E 1K0
Canada

Ross Video Incorporated

P.O. Box 880
Ogdensburg, New York
USA 13669-0880

General Business Office: (+1) 613 • 652 • 4886

Fax: (+1) 613 • 652 • 4425

Technical Support: (+1) 613 • 652 • 4886

After Hours Emergency: (+1) 613 • 349 • 0006

E-mail (Technical Support): techsupport@rossvideo.com

E-mail (General Information): solutions@rossvideo.com

Website: <http://www.rossvideo.com>

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Introduction

In This Chapter

This chapter contains the following sections:

- Overview
- Functional Block Diagram
- User Interfaces
- Documentation Terms and Conventions

A Word of Thanks

Congratulations on your purchase of the Ross Video MDK-111A-K HD/SD Quad Logo Inserter. The MDK-111A-K is part of a full line of Ross Video digital products which are backed by over 25 years of engineering and design expertise. You will be pleased at how easily your new card fits into your overall working environment. Equally pleasing is the product quality, reliability, and functionality.

Should you have a question pertaining to the installation or operation of your MDK-111A-K, please contact us at the numbers listed in the section “**Contact Us**” located at the back of this manual. Our technical support staff is always available for consultation, training, or service.

Overview

The MDK-111A-K provides four independent input/output streams with one dedicated logo inserter per stream.

The MDK-111A-K is an advanced high density 4 channel quad logo inserter providing cost-effective channel branding. Each of the 4 input streams can independently have an animated logo inserted. For example, the MDK-111A-K can take 4 different input streams, key a logo on each of the streams, outputting 4 streams each with their own unique branding. Each stream has complete independent transition control over the logo insertion. The internal key sources can be any size up to full-frame and can be positioned anywhere on screen. This makes the insertion of trouble slides, content rating bugs, and station ID logos simple and very cost-effective.

A CompactFlash™ is provided at the card-edge for local near line storage of logo content with scalable on-board, on-line memory for logo layout. The system is delivered with 2Gbps standard for both CompactFlash and on-line memory.

The MDK-111A-K supports TGA, PNG, BMP and JPG file formats with a dedicated Ethernet connection for transferring images direct to the MDK-111A-K.

Features

The following common features are included:

- Compliance with SMPTE 292M (1.485Gbps) and SMPTE 259M (270Mbps)
- Four separate stills/animations in use at any time (Logos 1 to 4); each logo may also have an optional Alpha channel (Alpha 1 to 4)
- Supports RossLinq for uploading still images from XPression to the Logo channels
- 2GB of DDR playout memory with support for TGA, PNG and JPG formats
- Multi-Definition support of popular formats such as 1080i, 720p, 480i, and 576i
- Eight bi-directional ports that are user programmable to be a GPI or a Tally
- Bypass relay from BKGD A to OUT 1 (*8320AR-033 rear module only*)
- Bypass relay from BKGD A to OUT 1 and from BKGD B to OUT 2 (*8320AR-061 rear module only*)
- User selectable card analog reference
- Supports SMPTE 12M Linear Timecode (LTC) on the serial port or via the GPI port
- Specify how the input signal timing is reported (relative to the reference or the output)
- Report status and configuration remotely via the DashBoard Control System
- Remote serial control of the card using the GVG M-2100 protocol
- Ethernet 10/100 Mbit connectivity for easy upgrades in the field
- Independent Proc-Amp control on outputs
- Support keyer controls such as clip and gain, key invert, box mask, and transparency
- Supports SNMP alarms for the input and reference signals
- Four SDI inputs allow you to input four background sources into the MDK-111A-K
- One internal keyer for each of the four program outputs
- Fully compliant with openGear specifications and installs in the openGear frames
- 5 year transferable warranty

Functional Block Diagram

The MDK-111A-K is a single card broadcast quality digital keyer designed specifically for broadcast or production situations.

8320AR-033 Rear Module

Figure 1.1 is a functional block diagram of the MDK-111A-K with the 8320AR-033 rear module.

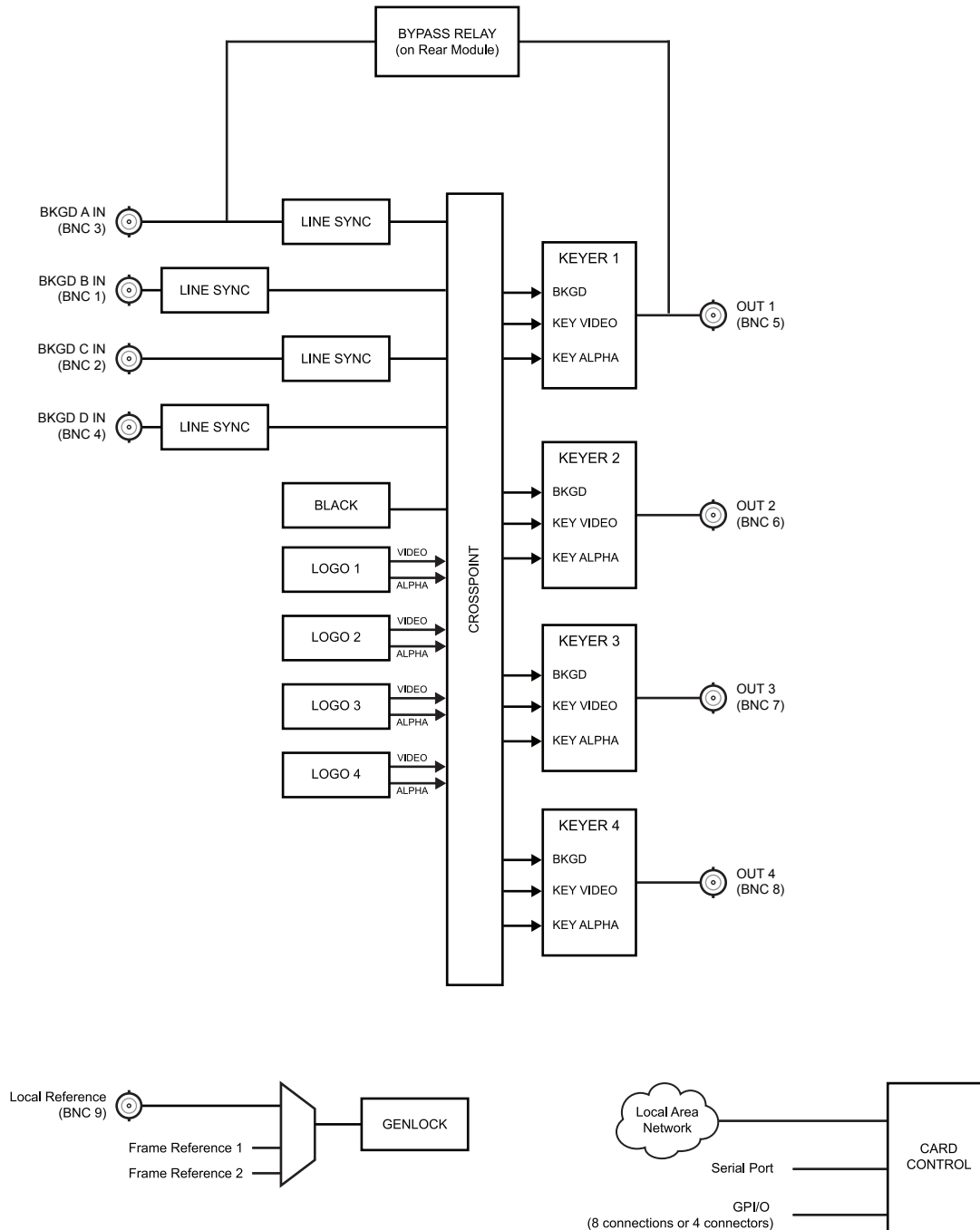


Figure 1.1 MDK-111A-K Block Diagram — 8320AR-033 Rear Module

8320AR-061 Rear Module

Figure 1.2 is a functional block diagram of the MDK-111A-K with the 8320AR-061 rear module

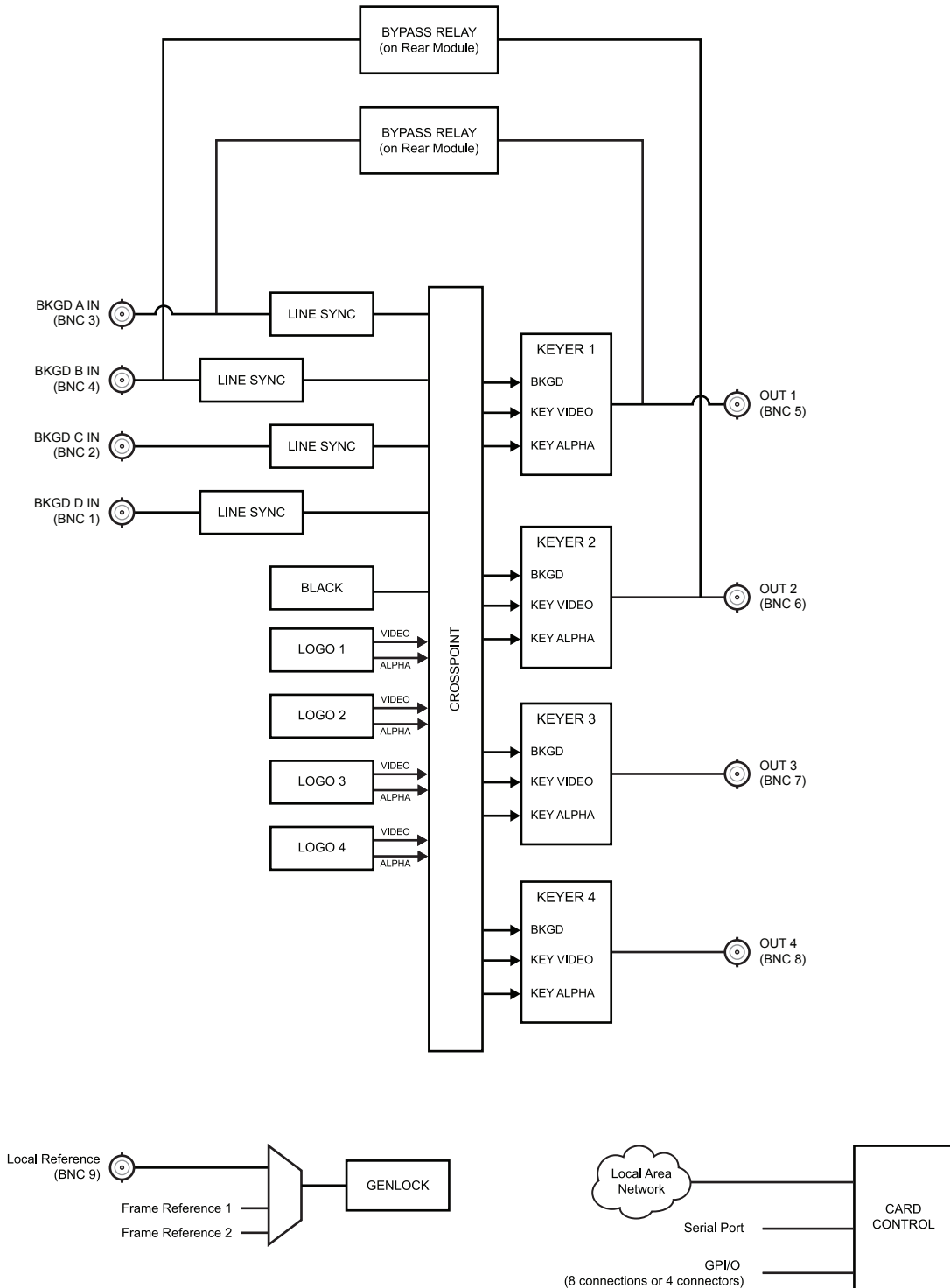


Figure 1.2 MDK-111A-K Block Diagram — 8320AR-062 Rear Module

User Interfaces

The MDK-111A-K includes the following user interfaces.

DashBoard Control System

DashBoard enables you to monitor and control openGear frames and cards from a computer. DashBoard communicates with other cards in the openGear frames through a Network Controller Card. This controller card is required in order to use DashBoard to monitor the MDK-111A-K.

For More Information on...

- setting up the Network Controller Card, refer to the *MFC-8300 Series or MFC-OG3 Series User Manual*.
- using DashBoard, refer to the *DashBoard User Manual*.
- the tabs and menus available for the MDK-111A-K in DashBoard, refer to “**DashBoard Menus**” on page 6-1.

Card-edge Monitoring

The front-edge of each card features LED indicators for input status and communication activity. The card-edge also includes a 3-position jumper block used to configure the termination on the local reference input.

For More Information on...

- card-edge features, refer to the section “**Card Overview**” on page 2-3.
- card-edge LEDs, refer to the section “**Card-edge LEDs**” on page 2-4.

SNMP Monitoring

The Network Controller Card in the openGear frame provides optional support for remote monitoring of your frame the using Simple Network Management Protocol (SNMP), which is compatible with many third-party monitoring tools.

For More Information on...

- the available SNMP monitoring features, refer to the Management Information Base (MIB) file that came with your card.
- SNMP monitoring, refer to the user manuals for your openGear frame and Network Controller Card.

Documentation Terms and Conventions

The following terms are used throughout this manual.

Terms

The following terms are used:

- “**Active image**” refers to the portion of the video picture area (production aperture) that is being utilized for output content. Active image excludes letterbox bars and pillarbox bars.
- “**Auto Select Key**” is a key in which two video signals are required to insert the key. The Key Alpha is used to cut the hole in the video and Key Video is used to fill the hole.
- “**Board**” or “**Card**” refers to the MDK-111A-K, including all components and switches unless otherwise noted.
- “**DashBoard**” refers to the DashBoard Control System client software.
- “**DFR-8321 series frame**” refers to all versions of the DFR-8321 series frames and any available options.
- “**DID**” refers to Data Identifier.
- “**Multiple Transition**” refers to a transition between both the Background sources and the Key sources simultaneously.
- “**Network Controller Card**” refers to the MFC-8320-N, MFC-8322-N, and MFC-OG3-N Series Network Controller Cards unless otherwise indicated.
- “**OG3-FR series frame**” refers to all versions of the OG3-FR series frame and any available options.
- “**openGear frame**” refers to the DFR-8321 series and the OG3-FR series frames unless otherwise noted.
- “**Operator**” and “**User**” refers to the person who uses the MDK-111A-K.
- “**Production aperture**” refers to the image lattice that represents the maximum possible image extent in a given standard (e.g. the full size of all active pixels and active lines). For example, the 1080i production aperture would be 1920x1080.
- “**SDID**” refers to Secondary Data Identifier.
- “**Self Key**” is a key in which the luminance, or brightness, values of the key source is used as the alpha for the key.
- “**System**” and “**Video System**” refers to the mix of interconnected digital and analog production equipment in which the MDK-111A-K operate.

Conventions

The following conventions are used:

- 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 the basic physical installation and communications setup of your MDK-111A-K.

The following topics are discussed:

- Before You Begin
- Card Overview
- Card Installation
- Cabling Overview
- Serial Port Cabling
- Ethernet Port Cabling
- GPI/Tally Cabling
- Linear Timecode Cabling

Before You Begin

Before you begin, ensure that you are using DashBoard version 6.2.0 or higher. The DashBoard Control System software and user manual are available to download from the Ross Video website.

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 card 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.

Related Publications

It is recommended to consult the following Ross Video documentation before installing and configuring your card:

- *DashBoard User Manual*, Ross Part Number: 8351DR-004
- *OG3-FR Series User Manual*, Ross Part Number: 8322DR-005
- *MFC-OG3 Series User Manual*, Ross Part Number: 8322R-004

Card Overview

This section provides an overview of the MDK-111A-K components.

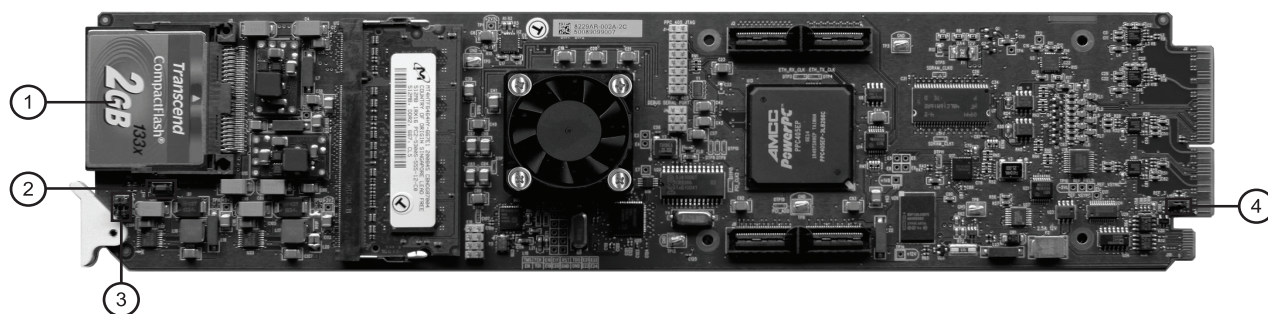


Figure 2.1 Card-edge Components

1) CompactFlash® Card	3) JP5, JP6
2) Board Reset Button (SW1)	4) Reference Termination (JP7)

1. CompactFlash® Card

The CompactFlash card provides 2GB of flash memory to administer media files, such as stills and animations, for the MDK-111A-K.

2. Board Reset Button (SW1)

Pressing this button resets the microprocessor and re-initializes the card. This is a hard reset of the card and settings are not saved. This may cause loss of data and should only be performed as advised by Ross Video Technical Support.

3. JP5, JP6

These jumpers are not yet implemented and must be left in the default position of Pin 2 (center) and Pin 3 (bottom).

4. Reference Termination (JP7)

J7 is a 3-position jumper block used to configure the 75ohm termination on the local analog reference input on **BNC 9** of the rear module.

- **Pin 1** (left) + **Pin 2** (center) position — In this position, the analog reference is terminated with an 75ohm resistor. This configuration is to be used for point-to-point cabling, or on the last card of a daisy chain topology. This is the default position (**Figure 2.2**).

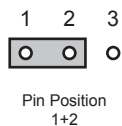


Figure 2.2 J7 — Default Position

- **Pin 2** (center) + **Pin 3** (right) position — In this position, the 75ohm terminator is removed and the analog reference is not terminated. This configuration is used in a daisy chain cabling topology where only the last card is to be terminated.

Card-edge LEDs

This section describes the card-edge LEDs. **Figure 2.3** outlines the locations of the card-edge controls.

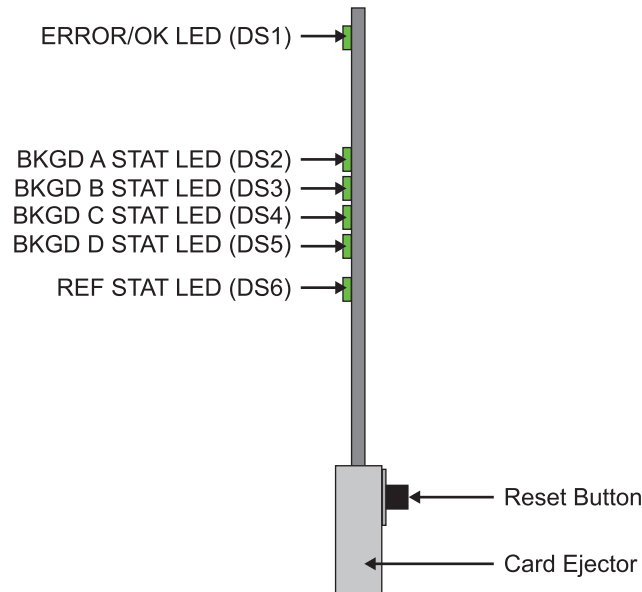


Figure 2.3 Card-edge Controls

Table 2.1 LEDs on the Card-edge

LED	Color	Display and Description
ERROR/OK	Green	When this LED is green, the card is in normal operation with no errors.
	Red	When this LED is red, the card is experiencing internal errors.
	Off	When this LED is off, there is no power to the card.
BKGD A STAT	Green	When this LED is green, the BKGD A video input is valid.
	Red	When this LED is red, the BKGD A input is not present or is invalid.
BKGD B STAT	Green	When this LED is green, the BKGD B video input is valid.
	Red	When this LED is red, the BKGD B input is not present or is invalid.
BKGD C STAT	Green	When this LED is green, the BKGD C input is valid.
	Red	When this LED is red, the BKGD C input is not present or is invalid.
BKGD D STAT	Green	When this LED is green, the BKGD D input is valid.
	Red	When this LED is red, the BKGD D input is not present or is invalid.
REF STAT	Green	When this LED is green, the reference signal is valid.
	Red	When this LED is red, the reference signal is not present or is invalid.

Card Installation

This section provides a brief overview of the required rear modules and physical installation of the MDK-111A-K.



Important — *If possible, do not block the ventilation holes on the top of the openGear frame that houses the MDK-111A-K. A 1RU open space above the frame gives the maximum air cooling and allows the frame filled with MDK-111A-K cards to operate at the maximum ambient temperature of 40°C. If these holes are blocked, then the maximum operating ambient temperature must be de-rated from 40°C to 35°C.*

Supported Rear Modules

The **8320AR-033** or the **8320AR-061** rear module can be used. Each rear module occupies four slots in the openGear frame.

Power Fail Relay

When using the 8320AR-033 rear module, there is a power fail relay from **BKGD A IN** to **OUT 1** on the rear module.

When using the 8320AR-061 rear module, there is a power fail relay from **BKGD A IN** to **OUT 1** and from **BKGD B IN** to **OUT 2** on the rear module.

The purpose of each relay is as follows:

- When the card is removed from the frame, the relay passes video from **BKGD A IN** to **OUT 1** (and **BKGD A IN** to **OUT 1** on the 8320AR-061 rear module) of the card. This allows the card to be serviced without interrupting the video signal.
- If the card loses power, or the frame loses power, the video still passes through.
- When the card boots, the relay will be left in Bypass mode until the card can generate a valid output. Once the card is up and functional, the relay is disabled.

Installing a Rear Module

If the rear module is already installed, skip this section.

To install a rear module in an openGear frame

1. Ensure that the openGear frame is properly installed according to instructions.
2. Remove the Blank Plates from the rear of the selected card frame slots.
 - **8320AR-033** — You will need to remove 2 blank plates.
 - **8320AR-061** — You will need to remove 2 blank plates.
3. Seat the bottom of the rear module in the seating slot at the base of the backplane of the frame. (**Figure 2.4**)

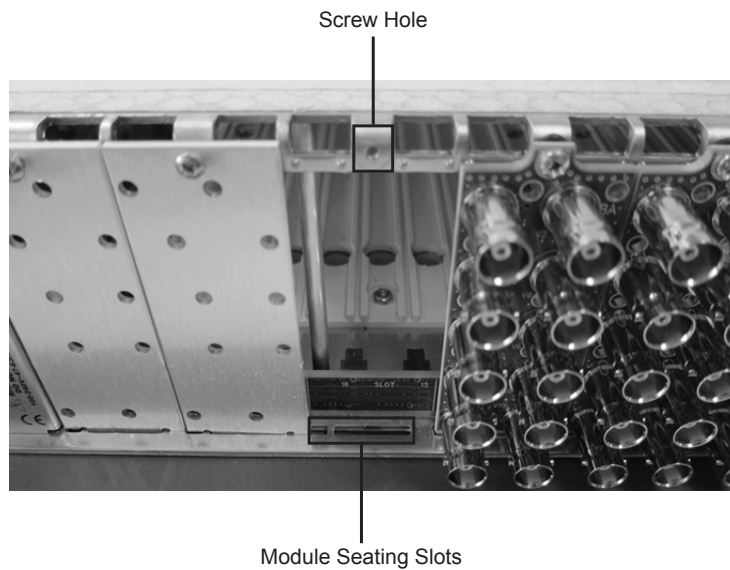


Figure 2.4 Rear Module Installation in an openGear Frame (One Blank Plate Removed)

4. Align the top hole of the rear module with the screw hole on the top-edge of the frame backplane.
5. Using a Phillips screwdriver and the supplied screw, fasten the rear module to the backplane. Do not over tighten.
6. Verify whether your rear module Label is self-adhesive by checking the back of the label for a thin wax sheet. You must remove the wax sheet before affixing the label.
7. Affix the supplied rear module Label to the BNC area of the rear module.
8. Ensure proper frame cooling and ventilation by having all rear frame slots covered with rear modules or Blank Plates.



Note — Verify that the card aligns with the rear module before fully tightening any of the slot screws.

Installing a Card

Use the following procedure to install the card in an openGear frame:

1. Ensure that the openGear frame is properly installed.
2. Ensure the rear module is properly installed.
3. Hold the card by the edges and carefully align the card edges with the rails in the frame.
4. Fully insert the card into the frame until the card is properly seated in the rear module.

Cabling Overview

This section summarizes the cabling for each supported rear module, and how to connect the video and references sources for your MDK-111A-K.

Rear Module Overview

This section provides an overview of the cabling designations for each rear module. You can use up to 80m of industry standard 75ohm coaxial cable.

8320AR-033 Rear Module

The 8320AR-033 rear module provides four video inputs and four video outputs.

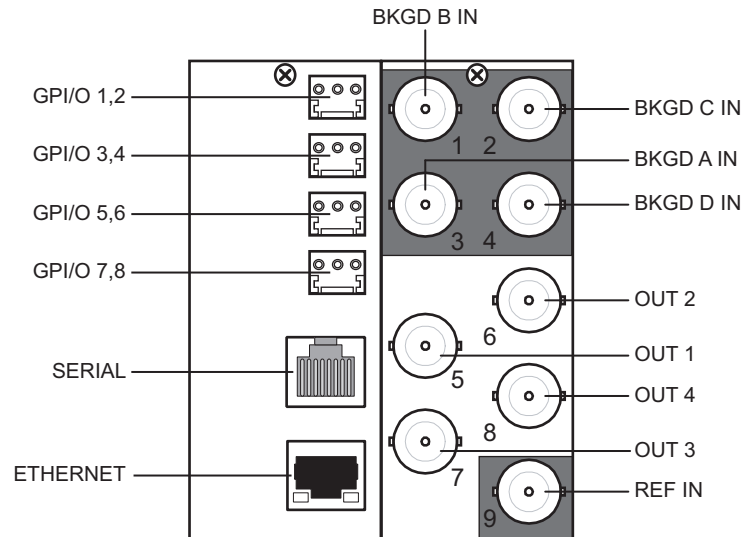


Figure 2.5 8320AR-033 Cable Connections

8320AR-061 Rear Module

The 8320AR-061 rear module provides four video inputs and four video outputs.

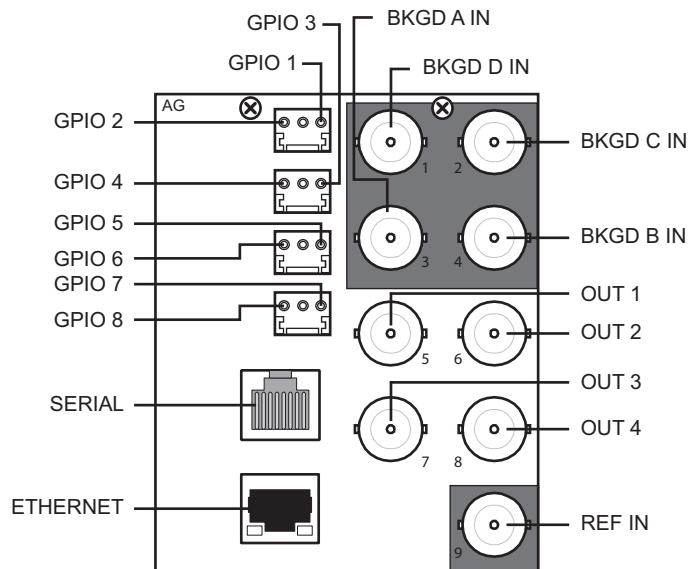


Figure 2.6 8320AR-061 Cable Connections

Cabling for the Input and Outputs

This section provides general instructions for video input and output cabling the rear module for the cards. Refer to **Figure 2.5** or **Figure 2.6** and the rear module label(s) for cabling designations.

To connect video input and output cables to the rear module

1. Connect the appropriate input video sources to the BNC connectors on the rear module.
2. Connect the output BNC connectors as required for your facility.

Cabling a Reference Source

Use the following procedure to cable the reference source for your card:

1. If you wish to use the frame reference source, connect the reference input to **REF 1** or **REF 2** input on the openGear frame.
2. If you wish to use a local reference input, connect the reference input source to the **REF IN** connector on your rear module. Refer to **Figure 2.5** or **Figure 2.6** for locations.
3. If you are using the local reference input on the rear module you must also configure **J7** on the card-edge. Choose from the following:
 - **Pin 1** (left) + **Pin 2** (center) position — In this position, the analog reference is terminated with an 75ohm resistor. This configuration is to be used for point-to-point cabling, or on the last card of a daisy chain topology. This is the default position (**Figure 2.2**).

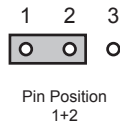


Figure 2.7 J7 — Default Position

- **Pin 2** (center) + **Pin 3** (right) position — In this position, the 75ohm terminator is removed and the analog reference is not terminated. This configuration is used in a daisy chain cabling topology where only the last card is to be terminated.

For More Information on...

- configuring your reference source in DashBoard, refer to the section “**Selecting the Reference Source**” on page 3-4.

Serial Port Cabling

The rear modules include an RS-422/232 serial communications port which can be used to remotely control the operations of the card. This section applies if you wish to control the card via a serial protocol, such as the GVG M-2100 protocol.

Serial Communication Cabling

This section outlines how to cable serial communications for the card. In order to properly complete this procedure, you need the following cables and equipment:

- **Serial Interface Cable** — This is a serial cable with a RJ-45 connector on one end and a connector on the other end to connect to your serial device. For the best performance, Ross Video recommends using a standard ethernet cable such as a CAT-5 or CAT-5e. **Table 2.2** includes serial cable pinout details. Ross Video does not supply this cable.

To set up serial communications for the card

1. Refer to **Table 2.2** for pinout information for your required **Serial Interface Cable**.
2. Connect and secure the RJ-45 connector of the **Serial Interface Cable** to the **Serial** port on the rear module. (**Figure 2.5** or **Figure 2.6**)
3. Connect and secure the other end of the **Serial Interface Cable** to the appropriate port on your serial device. Refer to the user manual for your serial device for pinout information and the required port to use.

For More Information on...

- configuring the **Serial** port for communications, refer to the section “**Serial Communication Setup**” on page 3-8.

Serial Port Pin Assignment

When building cables to interface to the card **Serial** port, it is recommended to use CAT-5 or CAT-5e cable with the standard ethernet wiring color coding. **Table 2.2** shows the pin assignment of the **Serial** port located on the rear modules.

Table 2.2 RJ-45 Pin Assignment

RJ45 Pin	RS-232	RS-422	RS-422 Null
1	n/c	Tx+	Rx+
2	Rx	Tx-	Rx-
3	Tx	Rx+	Tx+
4 ^a	+12V	+12V	+12V
5 ^a	+12V	+12V	+12V
6	n/c	Rx-	Tx-
7	GND	GND	GND
8	GND	GND	GND

- a. Two pins are reserved for +12V to provide power to a hand-held remote control panel.

Ethernet Port Cabling

The **Ethernet** port on the rear module is used to connect to an ethernet network for communications, software upgrades using DashBoard, media file management via an FTP client, and for viewing thumbnails

This section presents a general overview of the ethernet connection process. The exact steps for connecting your card to your facility via an ethernet network depends on the network requirements of your facility.



Note — *Contact your IT Department before connecting the card to your facility network to ensure that there are no conflicts. They will provide you with an appropriate value for the IP Address, Subnet Mask, and Gateway for the card.*

Ethernet Communication Cabling

Network topologies vary greatly between facilities. Contact your IT Department for assistance in connecting your card to the appropriate network at your location.

In order to properly complete this procedure, you need the following cables and equipment:

- **Ethernet Cable** — This is a standard network CAT-5 cable to connect the card to your facility network. You can use a standard straight-through ethernet cable, with no need for a crossover cable as the card includes an Auto-MDIX ethernet PHY that will switch from straight to crossover automatically as needed. Ross Video does not supply this cable.

To connect the card to an ethernet network

1. Ensure that you are running DashBoard Control System version 6.2.0 or higher before proceeding. The DashBoard software and user manual are available to download from the Ross Video website.
2. Connect the card to the same subnet as your DashBoard computer or to a network that has a route to the network your DashBoard computer is on. Refer to **Figure 2.5** or **Figure 2.6** for the **Ethernet** port location on the rear module.
3. Make a note of the IP Address as this information is required when configuring the communication settings for your card.

For More Information on...

- setting up the ethernet communications for the card, refer to the section “**Ethernet Communication Setup**” on page 3-3.

GPI/Tally Cabling

The MDK-111A-K includes eight General Purpose Input (GPI) and Tally pins to interface with external equipment. There are eight bi-directional pins labeled GPI/O 1-8 on the terminal block of the rear module. (**Figure 2.5** or **Figure 2.6**) Ports are user programmable to be either an input (GPI) or an output (Tally) using the **GPI/Tally Setup** tab in DashBoard. Electrically, the ports are setup for contact closure to ground, with 1Kohm pull-up resistor to +5V, so they default to a logical high state.



Note — *The default state for the GPI/O contacts is active low signaling. This way, if the card is removed from the openGear frame, no external events will be inadvertently asserted by the card. This also means that if a GPI cable is absent from the rear module, no GPI or Tally will be triggered and executed inadvertently by the card.*

GPI/Tally Cable Connections

The GPI ports are available on four 3-pin connectors located on the rear module. Four 3-pin mating connectors are provided with the rear module. This section provides information for connecting GPI/Tally cables to the installed rear module of your openGear frame.

To cable the rear module for GPIs and tallies

1. Locate the GPI/Tally ports on the rear module. Refer to the rear module labeling, and **Figure 2.5** or **Figure 2.6** for locations.
2. Wire the GPI/Tally ports as follows:
 - The left and right pins are the two GPI/O signals while the center pin is the common Ground (GND).
 - Refer to **Figure 2.8** for GPI/Tally configuration on the rear module.

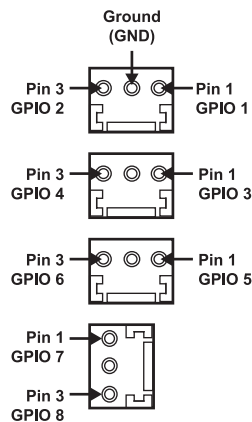


Figure 2.8 GPI Connections — 8320AR-033 and 8320AR-061 Rear Modules

For More Information on...

- setting up the communications for the GPI/Tally ports, refer to the section “**GPI/Tally Communication Setup**” on page 3-10.

Linear Timecode Cabling

The card receives Linear Timecode (LTC) on the **Serial** port, or via the **GPI** pins, then decodes and keys the timecode over the Background video. The outgoing video signal is rendered with a known and constant delay. This section presents a general overview of how to connect your LTC device to the MDK-111A-K.

LTC Cable Connections

There are two methods of cabling an LTC input to the MDK-111A-K: via the **Serial** port, or via one of the eight **GPI** ports, on the rear module. Note that how you connect to the LTC device determines how you must configure the communications between the LTC device and your card.

- **Serial** port — Use this port when the LTC device drives a balanced pair, following the recommended voltage amplitude defined in the SMPTE 12M specification. The LTC signal pair must be connected to the **Serial** port on the Rx+ and Rx- input pins.
- **GPI** port — Use one of these ports when the LTC device drives a single-ended TTL compatible signal.

For More Information on...

- on configuring your card to communicate with an LTC device, refer to the section “**LTC Communication Setup**” on page 3-12.

To cable a serial connection for an LTC input

1. Refer to **Table 2.3**, and your LTC device documentation, for pinout information for your required Serial Interface Cable.

Table 2.3 Interface Cable for LTC Input

RJ45 Pin	RS-422 Serial COM Rx Port	LTC Signal
1	Tx+	
2	Tx-	
3	Rx+	LTC+
4	+12V	
5	+12V	
6	Rx-	LTC-
7	GND	GND
8	GND	GND

2. Connect and secure the RJ-45 connector of the Serial Interface Cable to the **Serial** port on the rear module. (**Figure 2.5** or **Figure 2.6**)
3. Connect and secure the other end of the Serial Interface Cable to the appropriate port on your LTC device. Refer to the user manual for your LTC device for specific pinout information and the required port to use.
4. Proceed to the section “**LTC Communication Setup**” on page 3-12 to configure the card to communicate with the LTC device.

To cable a GPI port for an LTC input



Note — *When using a GPI port for LTC, the LTC interface must be TTL compatible where $V(IH)$ is 2.0V-5.0V, and $V(IL)$ is 0.0V-0.8V.*

1. Locate the GPI/Tally ports on the rear module.
2. Wire the GPI/Tally port for an LTC input as follows:
 - The left and right pins are the two GPI/O signals while the center pin is the common Ground (GND).
 - Refer to **Figure 2.8** for GPI configuration on the rear module.
 - Refer to your LTC device documentation for specific pinout information.
3. Proceed to the section “**LTC Communication Setup**” on page 3-12 to configure the card to communicate with the LTC device.

Configuration

In This Chapter

This chapter provides instructions for configuring the MDK-111A-K using the options available in DashBoard. The procedures in this chapter assume that you are navigating from the Device View of your card.

The following topics are discussed:

- Using DashBoard
- Ethernet Communication Setup
- Selecting the Reference Source
- Configuring the Video Inputs and Outputs
- Serial Communication Setup
- GPI/Tally Communication Setup
- LTC Communication Setup
- Loading the Factory Defaults
- Personality Options
- Software Upgrades



Note — *Before proceeding, ensure that you are running DashBoard software version 6.2.0 or higher. The DashBoard Control System software and user manual are available to download from the Ross Video website.*

Using Dashboard

Before proceeding, ensure that the Dashboard client software is installed on a PC connected to your facility network. The Dashboard software and user manual are available from the Ross Video website.

For More Information on...

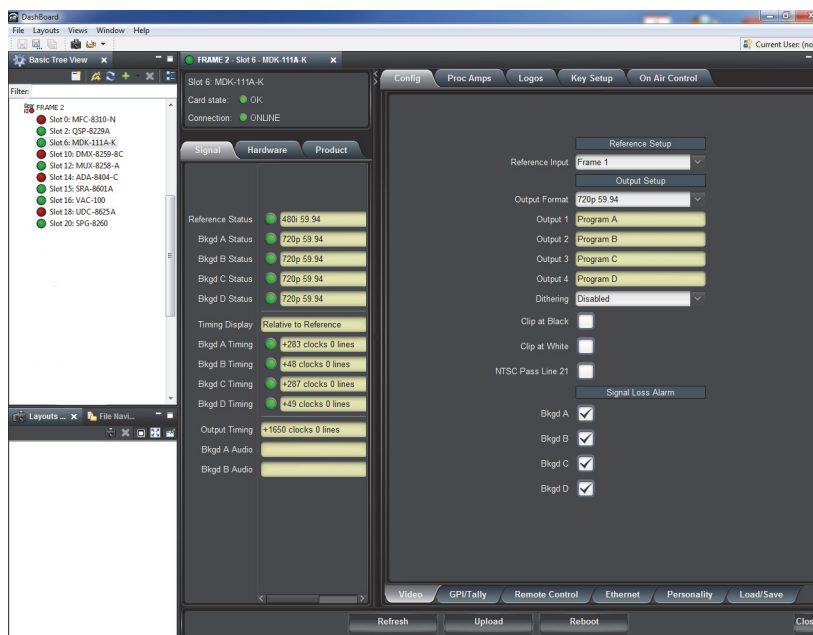
- installing and using Dashboard, refer to the *Dashboard User Manual*.

To launch Dashboard

- Ensure that you are running Dashboard software version 6.2.0 or higher.
- Launch Dashboard by double-clicking its icon on your desktop.
- Ensure that the openGear frame with the MDK-111A-K is displayed in the Tree View located on the left-side of the Dashboard window. If not, consult the *Dashboard User Manual*.

To access a card in Dashboard

- From the **Tree View**, expand the node for the openGear your cards are installed in. A list of cards installed in the frame is now displayed. In the example below, the node for FRAME 2 is expanded to show a list of cards including the MDK-111A-K.
- Double-click the node for a card to display its menus in the **Device View** of Dashboard (right-side of the Dashboard window).



Example of an MDK-111A-K in Dashboard

Ethernet Communication Setup

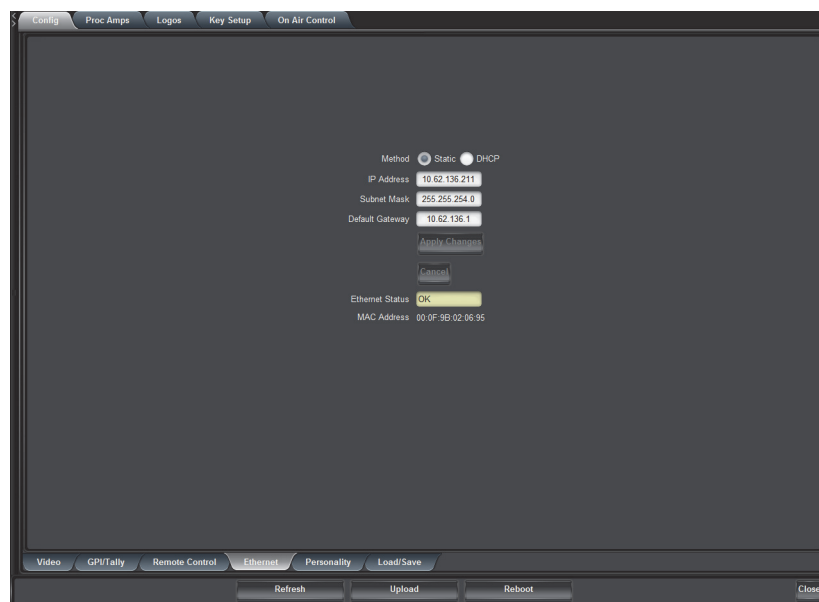
To enable the card to perform software upgrades, or to use an automation protocol to control the card via ethernet, the card must be configured with valid ethernet settings for the **Ethernet** port on the rear module. The settings can be specified manually (**Static**) or may be obtained automatically from a server on your network (**DHCP**).



Note — Connect the card to the same network as your DashBoard client computer or to a network that has a route to the network your DashBoard client computer is on. Refer to the section “**Ethernet Port Cabling**” on page 2-10 for cabling details.

To set up ethernet communications for the card

1. From the **Device View**, select the **Config** tab.
2. Select the **Ethernet** tab located at the bottom of the **Config** tab.



Config Tab — Ethernet Tab

3. To obtain network settings automatically, select **DHCP**.
4. To manually configure the ethernet settings:
 - Select **Static**.
 - Enter the **IP Address**, **Subnet Mask**, and **Default Gateway** settings for the card.
5. Click **Apply Changes** to save the new settings. Note that clicking **Cancel** will revert to the previous settings.

Selecting the Reference Source

The openGear frame supports a distributed frame reference, allowing incoming reference signals to feed timing information to all cards in the frame. Thus, a single composite or tri-level sync signal can be used for multiple cards. Alternatively, each card accepts a reference signal on the rear module to provide additional system timing flexibility.

For More Information on...

- cabling the reference source for your card, refer to the section “Cabling a Reference Source” on page 2-8.

Output Format Reference Compatibility

Depending on the reference format you use, the card will only be able to operate in certain formats as outlined in **Table 3.1**.

Table 3.1 Output/Reference Compatibility

Reference	Output							
	480i 59.94Hz	720p 59.94Hz	1080i 59.94Hz	576i 50Hz	720p 50Hz	1080i 50Hz	1080pSF 23.98Hz	1080pSF 24Hz
480i 59.94Hz	✓	✓	✓					
720p 59.94Hz		✓						
1080i 59.94Hz	✓	✓	✓					
576i 50Hz				✓	✓	✓		
720p 50Hz					✓			
1080i 50Hz				✓	✓	✓		
1080pSF 23.98Hz							✓	
1080pSF 24Hz								✓

Selecting a Reference Source

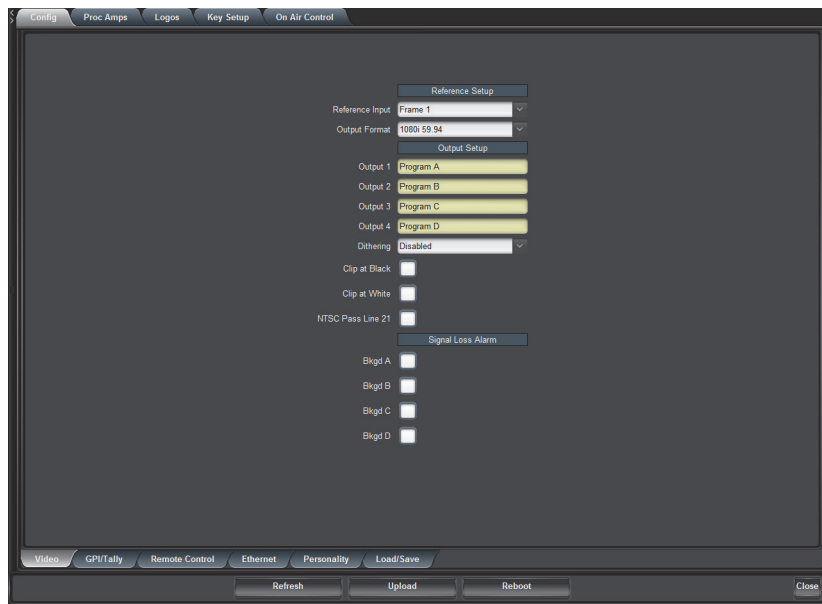
This section provides information for specifying the reference source for your card.



Operating Tip — Use the **Signal** tab to monitor the Signal status, including the reference and the Background sources. Refer to the section “Status Tabs” on page 6-2 for more information.

To select the reference source

1. From the **Device View**, select the **Config** tab.
2. Select the **Video** tab located at the bottom of the **Config** tab.



Config Tab — Video Tab

3. Select a reference source from the **Reference Setup** area. Refer to **Table 6.4** on page 6-5 for a list of options.

Configuring the Video Inputs and Outputs

The MDK-111A-K provides four independent input/output streams with one dedicated logo inserter per stream. This section outlines how to add delays, apply dithering, apply clipping, and enable NTSC Line 21 pass through.

Before Configuring the Video Inputs and Outputs

Keep the following in mind when configuring your video inputs and outputs:

- Each video input has a line sync that can support a full line of SD or HD video including horizontal blanking.
- All video inputs must be timed with the reference. The input tolerance is +/- 0.5 line. Exceeding this tolerance will result in the output shifting of 1 line.
- All of the video inputs must be compatible with the video format. If the formats are incompatible, the card reports an error in the DashBoard **Signal Status** area and on the card-edge LEDs.
- The four outputs are configured directly from the **On-Air Control** tab.
- Each output has a Proc Amp that can adjust parameters such as the black offset and gain.
- All of the outputs can be enabled to add dither, clip to SMPTE black or allow super-black, or clip to SMPTE white or allow super-white.
- Embedded audio from the Backgrounds is passed through unchanged to the corresponding outputs.

To configure the video outputs on the card

1. From the **Device View**, select the **Config** tab.
2. Select the **Video** tab located at the bottom of the **Config** tab.
3. To adjust the timing (affects all outputs):
 - Use the **Horizontal Delay** to specify the horizontal delay in clocks, relative to the selected reference. Refer to for information on the range of delay values on this tab.
 - Use the **Vertical Delay** to specify the vertical delay in lines, relative to the selected reference.
 - Use the **Frame Delay** to specify the delay in number of frames. Note that the actual processing delay is displayed in the **Output Frame Delay** field of the **Signal** tab.
 - Click **Reset** to reset the minimum delay values.
4. From the **Dithering** field, select the type of dithering you want to apply to all outputs. Refer to **Table 6.4** on page 6-5 for a list of options.
5. Enable the Clip White or Clip Black feature. Refer to **Table 6.4** on page 6-5 for a list of options.
6. Enable the **NTSC Pass Line 21** when using NTSC (480i) video format as outlined in **Table 6.4** on page 6-5.

Signal Loss Alarm Setup

The **Signal Loss Alarm** feature enables DashBoard to display status alarms when a loss of signal is experienced on the Backgrounds input sources. The alarm information displays in the **Signal**

tab of DashBoard and on the card-edge LEDs. For more information on the status LEDs, refer to the section “**Card-edge LEDs**” on page 2-4.

To set up the signal loss alarm feature

1. From the **Device View**, select the **Alarm Enables** tab.
2. Enable or disable the alarms by selecting or clearing the required boxes in the **Signal Loss Alarm** area as follows:
 - **BKGD A** — Select this box to enable DashBoard to report the status of the BKGD A input source.
 - **BKGD B** — Select this box to enable DashBoard to report the status of the BKGD B input source.
 - **BKGD C** — Select this box to enable DashBoard to report the status of the BKGD C input source.
 - **BKGD D** — Selecting this box enables DashBoard to report the status of the BKGD D input source.

For More Information on...

- messages displayed in the **Timing** fields, refer to the section “**Signal Tab**” on page 6-2.

Serial Communication Setup

The card serial interface can be configured to communicate with a variety of data rates and protocols. You can communicate with an external device using a serial protocol through the **Serial** port on the rear module, or via an ethernet connection. This section briefly outlines how to set up both communications using Dashboard.



Note — A protocol can only be active on the serial port, or on the ethernet port, but not both. Should you attempt to enable the same protocol on both ports, the card automatically disables the first port (the **Enabled** box is cleared).

For More Information on...

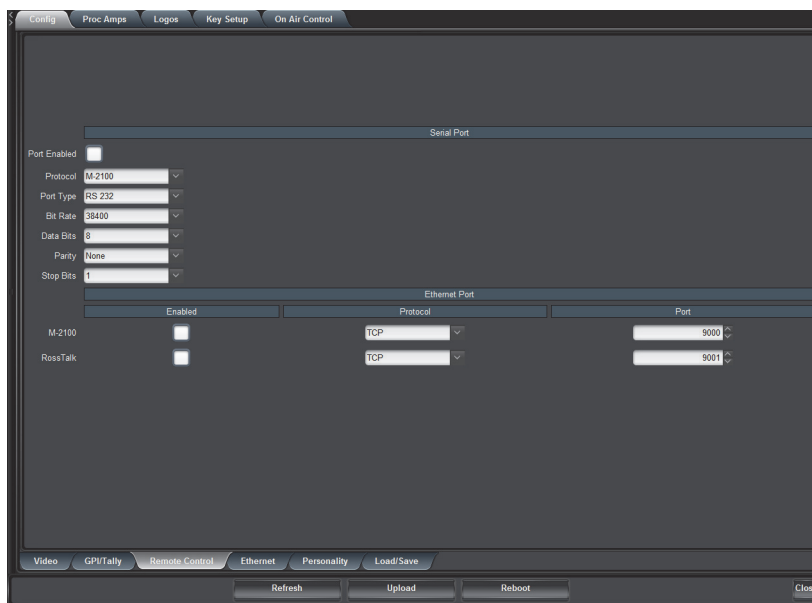
- cabling the **Serial** port, refer to the section “**Serial Port Cabling**” on page 2-9.
- cabling the **Ethernet** port, refer to the section “**Ethernet Port Cabling**” on page 2-10.

Serial Communications via a Serial Protocol

This procedure outlines how to establish communications with a device when it is connected to the **Serial** port on the MDK-111A-K rear module.

To configure the card to communicate via a serial protocol

1. From the **Device View**, select the **Config** tab.
2. Select the **Remote Control** tab located at the bottom of the **Config** tab.



Config Tab — Remote Control Tab

3. Select the serial communication protocol for the external device connected to the **Serial** port from the **Protocol** menu. Refer to **Table 6.7** on page 6-8 for a list of options.



Operating Tip — The **Port Type**, **Bit Rate**, **Data Bits**, **Parity**, and **Stop Bits** values are reset to their default values when a different Protocol is selected.

4. Select the electrical standard from the **Port Type** menu. Refer to **Table 6.7** on page 6-8 for a list of options.

5. Use the **Bit Rate**, **Data Bits**, **Parity** and **Stop Bits** fields to set the required parameters for the external serial device. Note that these settings have no effect when **Protocol** is set to **Timecode**.
6. Select the **Port Enabled** check box in the **Serial Port** area. When the Port is disabled, any incoming data on the serial port is discarded by the card.

Serial Communications via an Ethernet Connection

This procedure outlines how to establish communications with a device when it is connected to the **Ethernet** port on the MDK-111A-K rear module.

To configure the card to communicate via an ethernet protocol

1. From the **Device View**, select the **Config** tab.
2. Select the **Remote Control** tab located at the bottom of the **Config** tab.
3. To use the GVG M-2100 Protocol to control the card via ethernet:
 - Select the **M-2100 Enabled** check box located in the **Ethernet Protocol** area. When the box is cleared, any incoming data from the serial device is discarded by the card. Note that a protocol can only be active on the serial port, or on the ethernet port, but not both.
 - From the **Protocol** menu, select a Transport Layer Protocol. Refer to **Table 6.7** on page 6-8 for a list of options.
 - From the **Port** menu, specify the Port Address for your serial device. Choose a unique port number between 1 and 32767.



Note — *TCP ports 0, 21, 22, 80, and 6667 are unavailable for serial communications.*

GPI/Tally Communication Setup

This section explains how to configure communications for GPIs and Tallies on the card using the menus and options available in DashBoard. Each of the GPI/O ports can be configured as a GPI or Tally output. The GPI/O interface is ideal for simple key in / key out transitions.

GPI Overview

When configured as a GPI, a port behaves as an input, and can be used to trigger actions such as Cut/Dissolve the Key and/or Background. A push-button switch, or an ON-OFF switch, may be directly connected between the port and the adjacent ground pin. Alternatively, an external device may drive a low level. Minimum pulse duration is 1ms, anything shorter will be filtered out.

Typically, users will configure the GPI for Edge trigger. This means that the action is carried out either on the falling edge (button is pushed), or rising edge (button is released), depending on which Polarity is selected. Alternatively, users may configure the GPI for Level trigger. In this mode, the action is carried out on both the rising and falling edges, so there are effectively two states. The Polarity control can be used to invert the behavior. Regardless of the trigger type, GPI commands may be overridden by other command inputs such as serial protocols.

Edge

This option enables the GPI to act as a latching trigger. Edge triggers are used when you want to toggle between settings. This option enables the GPI to execute a specific function.

- If configured for Falling Edge, the selected function is executed when the GPI input signal transitions from High to Low.
- If configured for Rising Edge, the selected function is executed when the GPI input signal transitions from Low to High.
- Edge triggered GPI signals are sampled once a frame and the associated function is executed only once per frame. The minimum pulse width is 1 millisecond.
- Typically, the edge triggered GPI is driven by external equipment that generates one pulse per event.

Level

Level triggers are used when you want to assert a particular state for a setting. You define the on-air state of the function as being either Level High or Level Low. Therefore, if the on-air state of the Key is defined as Level High for example, when the GPI is a Level High signal, the Key will stay on air. If a Level Low is received, the Key will be taken off air.

- If configured for Active Low, the selected function is executed when the GPI input signal is driven Low.
- If configured for Active High, the selected function is executed when the GPI input signal is driven High.

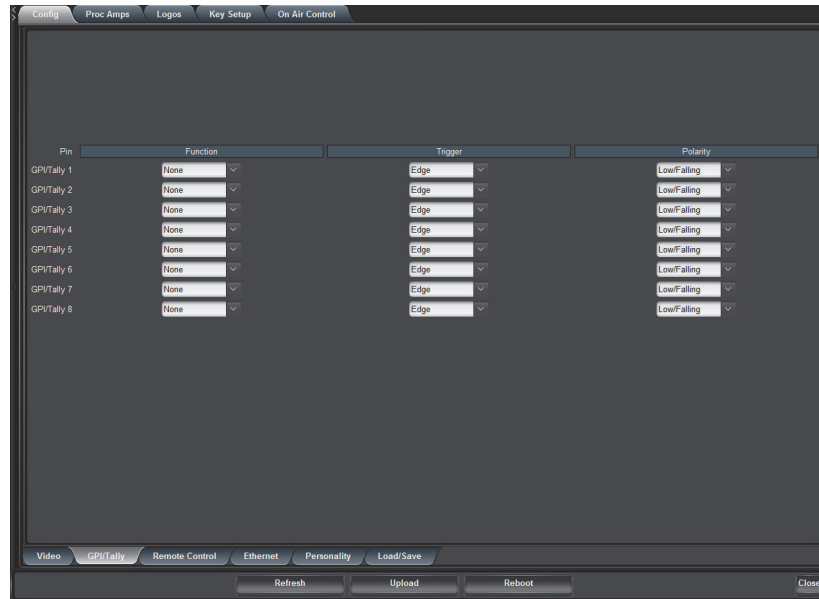
Tally Overview

When configured as a Tally, a port becomes an output, providing a status indicator. Typically this is used to indicate which input(s) are on-air at any given moment. Each tally output on the card can be configured to be active when any of the four inputs are on air. They can be configured as Active High or Active Low. The Trigger type (Edge or Level) is only relevant for GPI inputs and has no effect on Tally outputs. The tally outputs default to a logical high level when inactive. When the tally becomes active, for example the signal is on-air, then the output is driven low.

GPI Communication Setup

Use the following procedure to configure remote control for GPIs:

1. From the **Device View**, select the **Config** tab.
2. Select the **GPI/Tally** tab located at the bottom of the **Config** tab.



Config Tab — GPI/Tally Tab

3. Assign a transition event to a GPI by selecting the function next to the GPI in the **GPI/Tally** area. Refer to **Table 6.5** on page 6-6 for a list of options.
4. Select a trigger for the GPI from the **Trigger** column. Refer to **Table 6.5** on page 6-6 for a list of options.
5. Select a Polarity for the GPI from the **Polarity** column. Refer to **Table 6.5** on page 6-6 for a list of options.

Tally Communication Setup

When configured as a tally, a port becomes an output, providing a status indicator. Typically this is used to indicate which input(s) are on-air at any given moment. The tally outputs default to a logical high level when inactive. When the tally becomes active, such as the signal is on-air, then the output is driven low. It is possible to invert the signal using the **Polarity** feature.

To configure a tally for a selected card

1. From the **Device View**, select the **Config** tab.
2. Select the **GPI/Tally** tab located at the bottom of the **Config** tab.
3. Select what will drive the tally output when the input is on-air by selecting the function next to the **Tally** in the **GPI/Tally** area. Refer to **Table 6.5** on page 6-6 for a list of options.
4. Select the polarity of the tally from the **Polarity** column. Refer to **Table 6.5** on page 6-6 for a list of options.

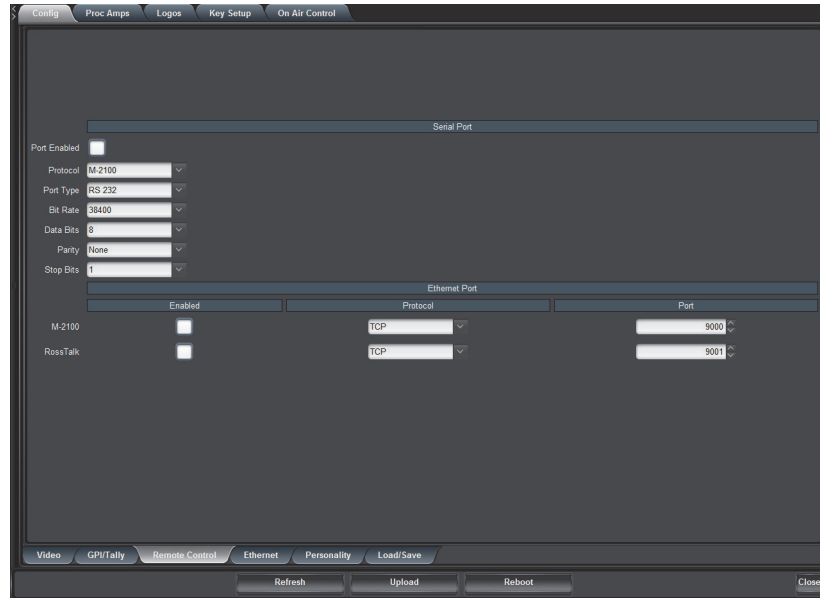
LTC Communication Setup

This section explains how to configure an LTC input to the card using the menus and options available in DashBoard.

Serial Communication Setup

Use the following procedure to configure serial communications for an LTC input:

1. From the **Device View** tab, select the **Remote Control** tab.



Config Tag — Remote Control

2. Locate the **Serial Port** area on the **Remote Control** tab.
3. Select **RS 422 unterm** from the **Port Type** menu.
4. Select **Timecode** from the **Protocol** menu.
5. Select the **Port Enabled** check box.

GPI Communication Setup

Ensure that only one GPI port is configured as an LTC input at one time. If you attempt to configure a second GPI port for timecode communications, the first GPI will be automatically assigned to **None**.

To configure GPI communications for an LTC input

1. From the **Device View**, select the **Config** tab.
2. Select the **GPI/Tally** tab located at the bottom of the **Config** tab.
3. Assign a GPI to the LTC input as follows:
 - From the **Function** menu for the GPI you are configuring, select **Timecode Input**.
 - The **Trigger** and **Polarity** fields are ignored.

Loading the Factory Defaults

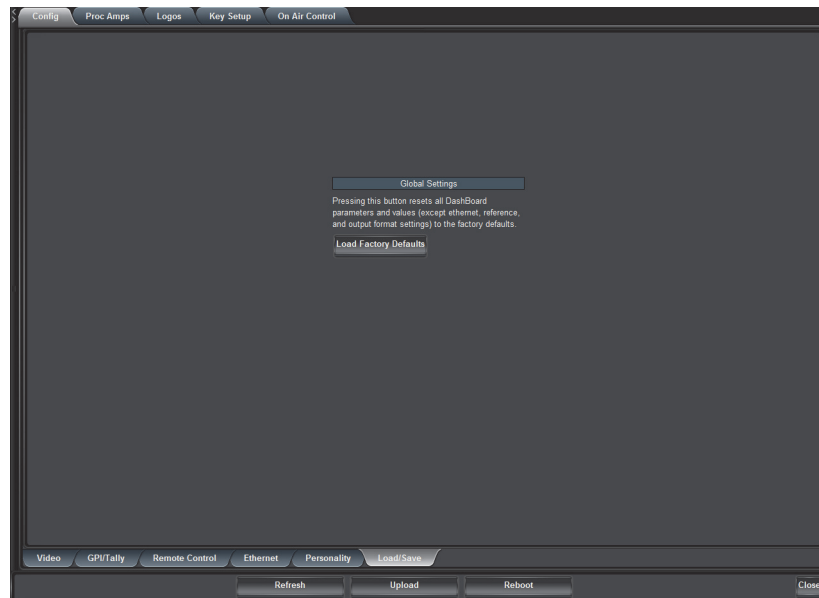
If required, the card menu parameters can be reset to the factory default values using the option available in the **Load/Save** tab.



Note — *Ethernet settings, reference input selection, and the output format are not reset using this method.*

To reset the card to the factory default settings in DashBoard

1. From the **Device View** tab, select the **Config** tab.
2. Select the **Load/Save** tab located at the bottom of the **Config** tab.



Config Tab — Load/Save Tab

3. From the **Global Settings** area, click **Load Factory Defaults** to display the **Confirm** dialog.
4. Click **Yes** to load the factory default values for all menu parameters, or **No** to cancel the load and close the dialog.

Personality Options

This section outlines how to configure the options available in the **Personality** tab.

Configuring the Transition Buttons

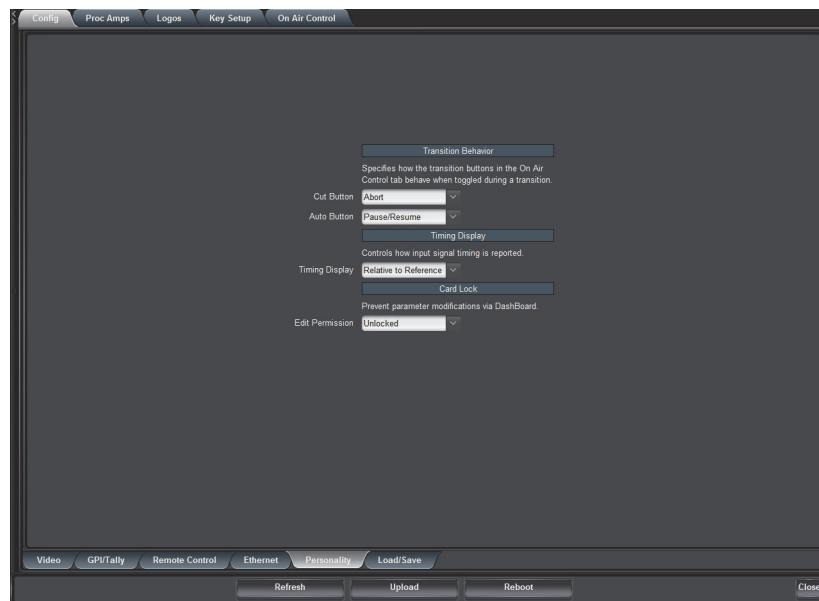
The **Personality** tab in DashBoard enables you to specify how the **Cut** and **Auto** buttons, in the **On Air Control** tab, behave when toggled during a transition.



Note — *The selected behavior also applies to GPI/Os.*

To configure the transition buttons

1. From the **Device View**, select the **Config** tab.
2. Select the **Personality** tab located at the bottom of the **Config** tab.



Config Tab — Personality Tab

3. Configure the **Cut** button behavior by choosing an option from the **Cut Button** menu. Refer to **Table 6.9** on page 6-11 for a list of options.
4. Configure the **Auto** button behavior by choosing an option from the **Auto Button** menu. Refer to **Table 6.9** on page 6-11 for a list of options.

Configuring the Edit Permissions

The **Personality** tab in DashBoard enables you to lock the card permission so that parameters are read-only and cannot be changed.

To configure the card edit permissions

1. From the **Device View**, select the **Config** tab.
2. Select the **Personality** tab located at the bottom of the **Config** tab.
3. Configure the edit permission by choosing an option from the **Edit Permission** menu. Refer to **Table 6.9** on page 6-11 for a list of options.

Configuring the Input Signal Timing Display

The **Timing Display** feature enables you to configure how the input signal timing is reported by DashBoard. This information is displayed in the **IN Timing** fields of the **Signal** tab in the number of clocks and lines. Negative values indicate the input signal timing is earlier than the reference. Positive values indicate the input signal timing is later than the reference. Note that there are 4400 clocks per line when using the 1080i 59.94Hz format.

To configure the input signal timing for your card

1. From the **Device View** tab, select the **Config** tab.
2. Select the **Personality** tab located at the bottom of the **Config** tab.
3. Configure how the signal timing by selecting an option from the **Timing Display** menu. Refer to **Table 6.9** on page 6-11 for a list of options.

Software Upgrades

The card can be upgraded in the field using the **Ethernet** port on the rear module and using the options available in DashBoard. Refer to the section “**Ethernet Communication Setup**” on page 3-3 for setting up ethernet communications.



Note — *This procedure assumes that you are running DashBoard v3.0.0 or higher.*

To upgrade the software on a card

1. Contact Ross Technical Support for the latest software version file.
2. Ensure the ethernet cable is connected to the **Ethernet** port on the rear module. Refer to the section “**Ethernet Port Cabling**” on page 2-10 for details.
3. Display the **Device** tab of the card by double-clicking its status indicator in the **Basic Tree View**.
4. From the **Device View**, click **Upload** to display the **Select file Upload** dialog for your card.
5. Navigate to the ***.bin** file you wish to upload.
6. Click **Open**.
7. If you are upgrading a single card, click **Finish** to start the upgrade. Proceed to step 9.
8. If you are upgrading multiple cards:
 - Click **Next >** to display the **Select Destination menu**. This menu provides a list of the compatible cards based on the card selected in step 3.
 - Specify the card(s) to upload the file to by selecting the check box(es) for the cards you wish to upload the file to.
 - Verify that the card(s) you wish to upload the file to. The **Error/Warning** fields indicate any errors, such as incompatible software or card type mismatch.
 - Click **Finish**.
9. Monitor the upgrade.
 - A **Upload Status** dialog enables you to monitor the upgrade process.
 - The card reboots automatically once the file is uploaded. The card is temporarily taken offline.
 - The reboot process is complete once the status indicators for the **Card State** and **Connection** return to their previous status.



Operating Tip — *If you are running DashBoard v2.3 or lower, you must click **Reboot** in the **Device** tab to complete the upgrade process.*

Troubleshooting

If you encounter problems when upgrading your card software, verify the following:

- Your network settings on the card are valid. Refer to **Table 6.8** for a list of settings.
- Ethernet communication is properly configured.
- The file you are attempting to load is a ***.bin** file that is for the card you are upgrading.

Operation

In This Chapter

This chapter provides a summary of the operational features, such as Proc Amp controls, Key Setup, and performing transitions in DashBoard.

The following topics are discussed:

- Adjusting the Proc Amp Controls
- Configuring a Key
- Performing Transitions



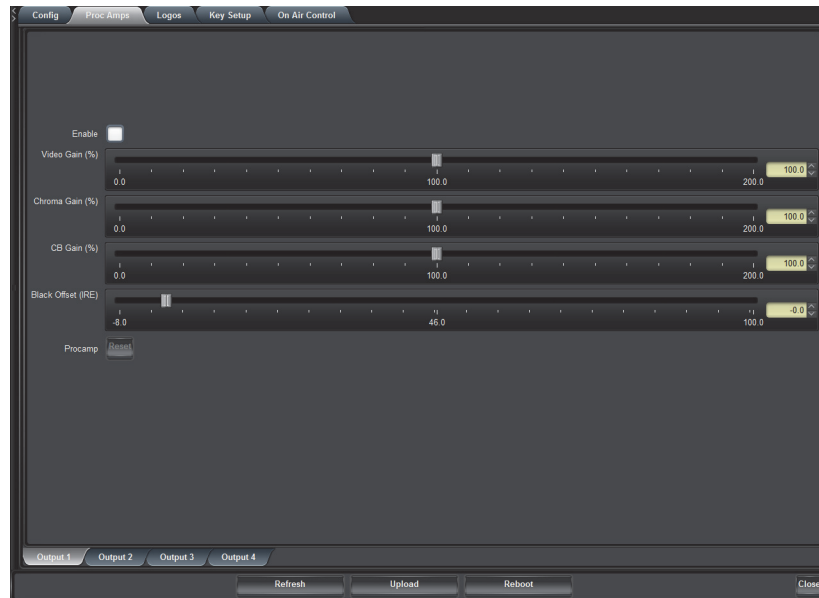
Note — *Before proceeding, ensure that you are running DashBoard software version 6.2.0 or higher. The DashBoard Control System software and user manual are available for download from the Ross Video website.*

Adjusting the Proc Amp Controls

Each output on the card has a Proc Amp that can adjust the black offset, the video gain, the chroma gain and the CB gain. This section briefly outlines how to adjust the options available in the **Proc Amp** tab.

To adjust an output using a Proc Amp

1. Select an output signal to adjust as follows:
 - Select the **Proc Amps** tab.
 - Select the **Output** tab for the output signal you want to adjust. The **Output** tabs are located at the bottom of the **Proc Amps** tab.



Proc Amps Tab — Output 1

2. Select the **Enable** box to ensure the color adjustments are applied. The **Enable** box must be selected in order for any color correction to take effect on the selected output.
3. Use the **Video Gain** slider to adjust the amount of Video Gain you want to apply to the Background and Key Video. Increasing overall gain causes an increase in contrast while also making colors more saturated and vivid. Decreasing overall gain causes a decrease in contrast while de-saturating colors.
4. Use the **Chroma Gain** slider to adjust the chrominance video signal components (Cr and Cb) simultaneously of the Background and Key Video. Increasing the chroma gain value causes the video signal colors to become increasingly saturated and more vivid. Decreasing the chroma gain value de-saturates color from the video signal until it is black and white.
5. Use the **CB Gain** slider to adjust the Cb component of the chrominance video signal of the Background and Key Video. Increasing the Cb Gain value causes the video signal colors to become increasingly saturated with blue. Decreasing the Cb Gain value de-saturates blue from the video signal.
6. Use the **Black Offset** slider to adjust the black offset of the Background and Key Video. Increasing the Black Offset value causes a lightening effect. Decreasing the Black Offset value causes a darkening effect.

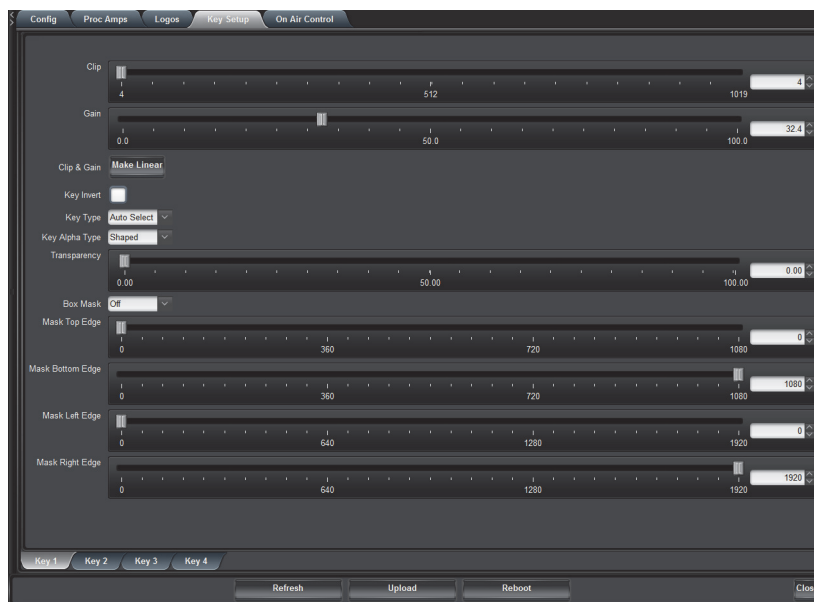
Configuring a Key

This section briefly describes how to set up Key Alphas, Auto Keys, adjust the Clip and Gain values, and how to apply a box mask.

Configuring a Key

Use the following procedure to configure a key:

1. From the **Device View**, select the **Key Setup** tab.



Key Setup Tab — Key 1

2. From the **Key Setup** tab, select the tab for the key you wish to configure.
3. Set the **Key Type** by choosing one of the following from the **Key Type** menu:
 - **Auto Select** — An Auto Select Key is a key in which two video signals are required to insert the key. The Key Alpha is used to cut the hole in the video, and the Key Video is used to fill the hole.
 - › Select an internal Logo channel (1-4).
 - › If an internal Logo channel is used, selecting this option takes the associated alpha signal.
 - › Note that the **Key Alpha Type** is automatically set to **Shaped**.
 - **Self** — A Self Key is a key in which the luminance, or brightness, values of the key source is used as the alpha for the key.
 - › Select an internal Logo channel (1-4).
 - › If an internal Logo channel is used, the luminance value of the associated alpha is applied.
 - › Note that the **Key Alpha Type** is automatically set to **Unshaped**.
4. If required, select the **Key Alpha Type** from the **Key Alpha Type** menu. Refer to **Table 6.13** on page 6-15 for a list of options.

5. Adjust the **Clip** and **Gain** values of the key as needed. Refer to **Table 6.13** on page 6-15 for a list of options.



Note — *Ross Video strongly recommends leaving the Clip and Gain values at the default settings to avoid undesirable effects.*

6. Adjust the **Transparency** level of the key as outlined in **Table 6.13** on page 6-15.
7. To invert the key, select the **Key Invert** box.

Masking a Key

The Box Mask uses a simple box shape to mask the key and can be adjusted for size and location, but cannot be rotated. All key types can be masked. The values of the Box Mask parameters are set in number of lines and pixels, and are therefore dependent on the video format you are using.

To apply a box mask to a key

1. From the **Device View**, select the **Key Setup** tab.
2. Set the **Box Mask** by choosing an option from the **Box Mask** menu. Refer to **Table 6.13** on page 6-15 for a list of options.



Key Setup Tab — Box Mask Area

3. Adjust the position of the mask using the Mask Edge sliders as outlined in **Table 6.13** on page 6-15.

Performing Transitions

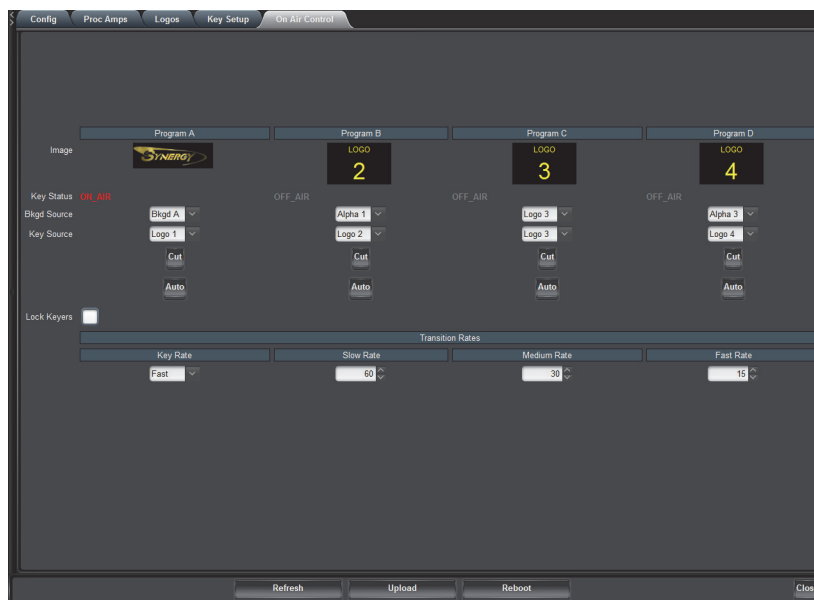
The transition can be set up in a number of ways and involve any number of elements such as the Background video, the external key, as well as the internal Logo channels. This section briefly outlines how to configure the transition options and how to perform basic transitions.

Transitions Setup

This section provides general instructions on setting up the transition options for the card using the options available in the **On Air Control** tab such as selecting sources, and configuring transition rates.

To set up the transition options on the card

1. Set up your Keys as outlined in the section “**Configuring a Key**” on page 4-3.
2. Select the **On Air Control** tab to display the menu options.



On Air Control Tab

3. Select the **Program** output for the Background from the **Bkgd Source** menu. This selects what is on the Program bus background. Choose from the following:
 - **Black** — Sets the source for the Background Program output to Black.
 - **BKGD #** — Select this option to assign the specified input source as the Background Program output.
 - **Logo #** — Select this option to assign the specified Logo channel as the Background Program output.
 - **Alpha #** — Select this option to assign the specified Alpha channel as the Background Program output.
4. Set the source for the **Background Preview** output from the **Background Preview** menu. Note that you are selecting a Logo channel source from the **Program A Key Source** menu. Choose from the following:
 - **Logo #** — Select this option to assign the specified Logo channel as the Background Preview (Program A Key Source) output.

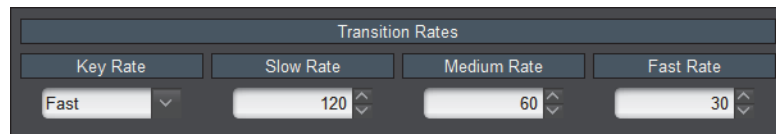
5. Repeat step 3. and step 4. for each Program output (B-D).
6. Configure the **Lock Keyers** option as follows:
 - **Check box selected** — When locked, the key transition and states are configured to transition at the same time. This means that when you click any **Cut** or **Auto** transition button, the four keys are transitioned at the same time. For example, Program A, B, and C are off-air and Program D is on-air. Click any **Cut** button on the **On Air Control** tab to perform a cut transition that takes Program A, B, and C on-air, and Program D is transitioned off-air.
 - **Check box cleared** — Disables this option.

Transition Rates

Transition rates set how much time, in frames, the card takes to perform an Auto Transition. You can set rates for the Background and Key transitions using the options in the **On Air Control** tab.

To set the background and key transition rates

1. Set up your Keys as outlined in the section “**Configuring a Key**” on page 4-3.
2. Set up your transition options as outlined in the section “**Transitions Setup**” on page 4-5.
3. In the **Device View**, select the **On Air Control** tab.
4. Locate the **Transition Rates** area on the tab.



On Air Control Tab — Transition Rates Area

5. Set the **Key Transition Rate** as follows:
 - From the **Key Rate** menu, select a transition rate to set up.
 - Specify the rate, in number of frames, as required, in the **Slow Rate**, **Medium Rate** and **Fast Rate** fields.
6. Set the **Auto Transition Rate** as follows:
 - From the **Key Rate** menu, select a transition rate to set up.
 - Specify the rate, in number of frames, as required, in the **Slow Rate**, **Medium Rate** and **Fast Rate** fields.

Performing a Cut Transition

Use the following procedure to perform a Cut transition on the card:



Note — Clicking the **Cut** button while a transition is already in progress can either abort, or instantly finish the transition depending on the option selected in the **Personality** tab. Refer to the section, “**Configuring the Transition Buttons**” on page 3-14 for details.

1. From the **Device View**, select the **On Air Control** tab.
2. If required, configure the **Cut** button behavior during a transition as specified in the section “**Configuring the Transition Buttons**” on page 3-14.

3. Verify the **Lock Keyers** option is configured as required. Refer to **Table 6.14** on page 6-17 for a list of options.
4. To perform a Cut transition for a Key:
 - Select a source for the Program output from the desired Key **Source** menu.
 - Click the corresponding **Cut** button for the Key located below the applicable thumbnail.
 - The Key is transitioned on or off air. The **Key Status** field(s) indicates the on-air status of the key.



Note — *To allow for audio cross fading, a cut takes six frames. Three frames are used for the audio fade down, the video is then cut, followed by a three frame audio fade up.*

Performing an Auto Transition

The speed at which the Auto transition is performed, in number of frames, is determined by the Transition Rate (Slow, Medium or Fast) set in the **Transition Rate** area.



Note — *Clicking the **AUTO** button while a transition in progress can either pause, ignore, or reverse the transition depending on the option selected in the **Personality** tab. Refer to the section “**Configuring the Transition Buttons**” on page 3-14 for details.*

To perform an auto transition on the card

1. Select the **On Air Control** tab to display the menu options in the **Device View**.
2. If required, configure the **Auto** button behavior during a transition as specified in the section “**Configuring the Transition Buttons**” on page 3-14.
3. Verify the **Lock Keyers** option is configured as required. Refer to **Table 6.14** on page 6-17 for a list of options.
4. If you want to select a different transition rate, set it now. Refer to the section “**Transition Rates**” on page 4-6 for details.
5. To perform an Auto Key transition:
 - Select the sources to be included in the transition.
 - Click the corresponding **Auto** button for the Key located below the applicable thumbnail.
 - The Key is transitioned on or off air. The **Key Status** field(s) indicate the on-air status of the key.

Media File Management

In This Chapter

This chapter provides information on managing the images and animations using the DashBoard options available for the MDK-111A-K.

The following topics are discussed:

- Overview
- Loading Media Files
- Adjusting On-Air Properties
- Managing Media Files
- Configuring a Logo Channel to Display LTC

Overview

The DashBoard menus enable you to select and configure the four Logo channels that are loaded in the MDK-111A-K. Each Logo channel has a sub-tab that enables you to assign a media file to the specified logo, view a thumbnail that represents the media file currently loaded, and adjust on-air properties.

The following tips and restrictions apply when managing your media files:

- Media files, such as stills and animations, are transferred to and from the MDK-111A-K using FTP protocol. The media files are stored on a CompactFlash® card that is installed on the MDK-111A-K.
- If you select an image size that is larger than the current video format this may corrupt the video output.
- When a media file is loaded, metadata, such as X/Y position, is also loaded, if it exists. Otherwise, default values are used. For animations, parameters are recalled after the last frame is loaded.
- When using Mac OS X™ to transfer files to the CompactFlash® Card via an FTP server, you may only have read-only access. Refer to your Mac OS X™ documentation for details.

For More Information on...

- loading a media file into a Logo channel, refer to the section “**Loading Media Files**” on page 5-3.
- adjusting the position of a still image, refer to the section “**Adjusting On-Air Properties**” on page 5-4.
- image specifications and renaming media files, refer to the section “**Managing Media Files**” on page 5-5.
- managing media files using an FTP client, refer to the section “**Connection using FTP**” on page 5-6.
- using the CompactFlash® card, refer to the section “**CompactFlash® Card**” on page 5-6.
- using timecode, refer to the section “**Configuring a Logo Channel to Display LTC**” on page 5-7.

Loading Media Files

The MDK-111A-K features four Logo channels (Logos 1-4) into which you can load files from the CompactFlash® Card physically installed on the MDK-111A-K. Each card has 2GB of DDR playout memory. **Table 5.1** lists an estimation of how many uncompressed frames can fit into the playout memory of the MDK-111A-K.

Table 5.1 Full Frame Animation

Format	Image Size	No Alpha	With Alpha
1080i, 1080p	1920x1080	382	254
720p	1280x720	859	573
576i	720x576	1911	1274
480i	720x486	2265	1510



Note — *Very large animations may take several minutes to load.*

Loading a Media File

From the **Directory** menu in the each **Logo** sub-tab, files may be loaded from the following locations:

- **[PATTERNS]** — A virtual directory that currently contains timecode overlays. Refer to the section “**Configuring a Logo Channel to Display LTC**” on page 5-7 for information on loading Timecode files.
- **[RAM CACHE]** — A virtual directory that displays media files that are already loaded in the playout memory. Selecting this directory enables you to quickly access a pre-loaded file from the memory.
- **[ROOT]** — This is the default directory and represents the top-most directory on the CompactFlash® Card. You can manage files on the CompactFlash® Card using an FTP connection. Refer to the section “**Managing Media Files**” on page 5-5 for details.
- **User created directories** — A list of user-created directories using an FTP connection.

To load a media file into a logo channel

1. Select a Logo channel as follows:
 - Select the **Logos** tab in the **Device View**.
 - Select the tab for the Logo channel you want to load the media file for.
2. If files were added or re-named using an FTP connection, click **Re-scan** to update the list of directories and filenames.
3. Select a media file to load to the Logo channel as follows:
 - From the **Directory** menu, select the directory you wish to load a file from.
 - From the **Filename** menu, select the file.



Note — *You can clear space in the image cache by selecting **None** from the **Filename** menu of any Logo channel. However, doing so immediately replaces the current media file with the file you are attempting to load.*

Adjusting On-Air Properties

The **Logo** tab in DashBoard allows you to adjust the position and play modes of media files. The following features are supported:

- **Auto Play** — When this feature is enabled, the animation will play from the first frame when it is brought to air. When this feature is disabled, the animation to air does not affect playback.
- **Looping** — When this feature is enabled, the animation will cycle continuously (from the last frame back to the first) in an endless loop. When this feature is disabled, the animation plays once, and freezes on the last frame. When both **Auto Play** and **Looping** are enabled, the animation begins to play on a transition, and keeps playing in an endless loop. If another transition is triggered, the animation jumps to the first frame and keeps playing in an endless loop.
- **Hold Time** — When this feature is enabled, the animation will play, but before looping back (if looping is enabled), it pauses on the last frame, for the specified Hold Time (in number of frames).

Parameters that are adjusted are saved with the image/animation. When a logo/animation is subsequently re-loaded, these parameters are also recalled. However, if there are no saved parameters for a recalled logo/animation, then the parameters remain unchanged.

For More Information on...

- the options in the **Logo** tab, refer to **Table 6.12** on page 6-13.

To adjust the on-air properties of a media file

1. Load a media file as outlined in the section “**Loading a Media File**” on page 5-3.
2. Adjust the position of a still image in the viewing area of the screen using the **X** and **Y Position** sliders. Keep in mind that you cannot position any portion of an image off-screen and full images cannot have their position adjusted.
3. Use the **Auto Play** check box to set whether the animation automatically starts to play when it is taken on-air.
4. Use the **Looping** check box to set whether the animation will start over when it reaches the last frame of the animation.
5. Use the **Hold Time** menu to include a pause between loops of an animation.
6. Select how an image is displayed by selecting an option from the **Play Mode** menu.



Note — *The **Play Mode** feature only applies to Interlaced video formats and has no effect when using Progressive video formats.*

Managing Media Files

Media files, such as animations and still images, can be transferred to and from the CompactFlash® Card using an FTP connection. Once transferred to the CompactFlash® Card, you use the options in the Logo tab to load the files and assign them to a Logo channel.

This section outlines the specifications for media files and provides general information on using the CompactFlash® Card and an FTP connection.

For More Information on...

- assigning media files to Logo channels, refer to the section “**Loading a Media File**” on page 5-3.

Image Specifications

Media files used on the MDK-111A-K must meet the specifications outlined in **Table 5.2**. Note that if larger images are used, the images will be clipped to the dimensions listed in **Table 5.2**.

Table 5.2 Media File Specifications

Parameter	Specification
File Type	BMP, GIF, JPEG, PNG, TGA
Compression	compressed and uncompressed
Interlace Formats (1080i, 480i, 576i)	Max. Image Width: 32,768 pixels
	Max. Image Height: dependent on available memory
Progressive Formats (1080p, 720p)	Max. Image Width: 65,536 pixels
	Max. Image Height: dependent on available memory
Animation Maximum Length	10,000 frames

File Naming Specifications

The name can contain letters, numbers, and spaces, but cannot contain symbols such as ! @ # & * () ? / , ' “.

If you are naming an animation, each file must be numbered in the sequence that it will play out. The following restrictions apply to file names for animations:

- Each file can use a minimum 3-digit number, including all the leading zeros.
- The file name and number must be separated by an _ followed by three or more digits, then a period (.).
- Each file in the sequence must have the same numbering scheme.
- The MDK-111A-K loads files in numerical order.

The following is an example of a 10-frame animation using a typical numbering scheme:

- DTVB_000.tga
- DTVB_001.tga
- ...
- DTVB_009.tga

Connection using FTP

You can use an FTP connection to media files to and from the CompactFlash® Card of the MDK-111A-K. You can also use an FTP client to delete images on the CompactFlash® Card and re-name images.

To access the MDK-111A-K via FTP

- Have the IP address from Config-Ethernet.
- Ensure an ethernet cable is plugged into the MDK-111A-K rear module. Refer to the section “**Ethernet Port Cabling**” on page 2-10 for connection details.

An FTP connection to the MDK-111A-K should be established by your facility IT department. The following information is required to create an FTP connection:

- **User Name** — **user**
- **Password** — **password**

Connection using RossLinq

RossLinq enables you to transfer still images directly from the XPression to a MDK-111A-K Logo channel. You can transfer files into any of the directories for any of the Logo channels on the card. There are four directories, each corresponding to a specific Logo channel on the card. The file can be a format as listed in **Table 5.2**. Note that the transfer of animations is not supported at this time. To connect to the XPression via RossLinq, you must establish an FTP connection using the following information:



Note — *The RossLinq channel in XPression must be set as a passive FTP connection in order to set up communications between XPression and the MDK-111A-K. Refer to the XPression documentation for details.*

- **IP Address** — This information is displayed in the **IP Address** field of the **Ethernet** tab in DashBoard for your card.
- **User Name** — **xpression**
- **Password** — **password**

For More Information on...

- using XPression, refer to the *XPression User Guide*.

CompactFlash® Card

The following tips and restrictions apply when using the CompactFlash® Card:

- the CompactFlash® Card must be installed on the MDK-111A-K before the MDK-111A-K powers up and must remain inserted.
- if you wish to remove the CompactFlash® Card for programming, you must re-boot the MDK-111A-K when you re-install the CompactFlash® Card. This allows the MDK-111A-K to recognize that a new CompactFlash® Card is available.
- the CompactFlash® Card is 2GB in size, the number of files you can store depends on the type of file (PNG, TGA, JPG). The **CompactFlash Status** field in the **Hardware** tab displays how much space is available on the CompactFlash® Card.

Configuring a Logo Channel to Display LTC

The **Logos** and **On Air Control** tabs in DashBoard enable you to assign an LTC input to a Logo channel, then assign that Logo channel to an output. This section summarizes the steps required to configure an output to display LTC text, and provides additional configuration information.

For More Information on...

- connecting an LTC device to the MDK-111A-K, refer to the section “**Linear Timecode Cabling**” on page 2-12.
- setting up communications between an LTC device and the MDK-111A-K, refer to the section “**LTC Communication Setup**” on page 3-12.

Overview

The timecode information displays on-screen in one of the following formats:

- | | |
|--------------------|---|
| ---:--:---:-- | This format is used when no LTC input signal is received. |
| HH:MM:SS:FF | This is the standard format. The timecode is displayed in Hours, Minutes, Seconds, and Frames. The drop-frames is not active. |
| HH:MM:SS;FF | The timecode is displayed in Hours, Minutes, Seconds, and Frames. The drop-frame is active. |

Frame Count Range

The frame count range depends on the video format you are using:

- When using Interlace Video Modes (480i 59.94Hz and 1080i 59.94Hz), the range is from 00 to 29.
- When using 576i 50Hz and 1080i 50Hz, the range is from 00 to 24.
- When using 1080pSF 23.98Hz and 1080pSF 24Hz, the range is from 00 to 23.
- When using 720p 50Hz, the range is from 00 to 49.
- When using 720p 59.94Hz, the range is from 00 to 59.



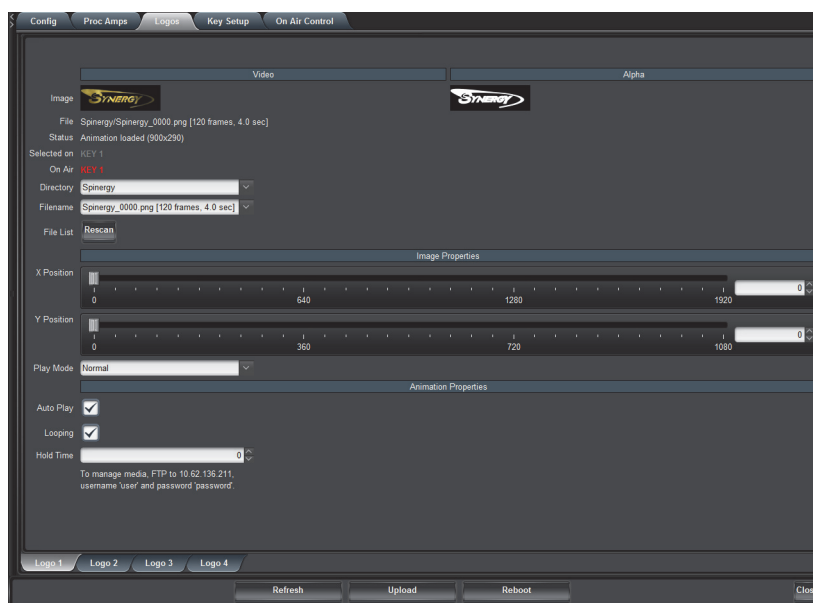
Note — *When using a progressive video format, the LTC standard only provides a count of every second frame, but the MDK-111A-K will increment and display the frame count on every frame.*

Configuring a Logo Channel to Display LTC

This section outlines how to configure an output on the card to display the timecode text from an LTC device.

To configure a Logo channel for displaying LTC on-screen

1. Select a Logo channel to configure as follows:
 - Select the **Logos** tab in the **Device View**.
 - Select the tab for the Logo channel you want to load the timecode file for.



Logos Tab

2. Select a timecode file to load to the Logo channel as follows:
 - From the **Directory** menu, select **[PATTERNS]**.
 - From the **Filename** menu, select one of the following:
 - › **Timecode - Large** — The timecode is set in large font.
 - › **Timecode - Medium** — The timecode is set in medium font.
 - › **Timecode - Small** — The timecode is set in small font.
3. Adjust the transparency and other on-air properties for the output as described in the section “**Configuring a Key**” on page 4-3.



Note — *It is recommended to set the **Key Alpha Type** to **Unshaped**.*

4. Adjust the on-screen position of the timecode by selecting one of the following:
 - **X Position** — Use this option to adjust the horizontal position of the timecode on the screen.
 - **Y Position** — Use this option to adjust the vertical position of the timecode on the screen.
 - You cannot position any portion of a timecode off-screen.
5. Assign the Logo channel to an output as follows:
 - Click the **On Air Control** tab to display the menu options in the **Device View**.
 - Locate the output you wish to assign the Logo channel to.
 - From the associated **Key Source** box, select the Logo channel to assign it to the output.

Configuration Notes

Keep the following in mind when configuring a Logo channel for displaying LTC on-screen:

- The **Status** field on the **Logo** tab indicates the dimensions of the timecode file in the number of pixels. Note that this value changes depending on the video format you are using.
- To assign the same LTC to multiple outputs, configure a Logo channel with the LTC and then assign that Logo channel to multiple key sources.

For example, to assign LTC to the Logo 3 channel and then assign it to multiple outputs on the MDK-111A-K:

- › Configure **Logo 3** to display LTC.
- › Navigate to the **On Air Control** tab of DashBoard.
- › Select **Logo 3** from the **Source** box for Key 1, Key 2, Key 3, and Key 4.
- Should you attempt to load the same LTC to a second Logo channel, an error occurs and a message is displayed in the **Status** field of the second Logo tab.
- You can enable the **Lock Keyers** feature to transition multiple outputs at one time.

DashBoard Menus

In This Chapter

This chapter briefly summarizes the menus, items, and parameters available in DashBoard for the MDK-111A-K. Default values are noted with an asterisk (*).

The following topics are discussed:

- Status Tabs
- Configuration Menus
- Proc Amps Tab
- Logos Tab
- Key Setup Menus
- On Air Control Tab



Note — *Before proceeding, ensure that you are running DashBoard software version 6.2.0 or higher. The DashBoard Control System software and user manual are available to download from the Ross Video website.*

Status Tabs

This section briefly summarizes the read-only information displayed in the **Status** tabs. The fields in the Status tabs vary in severity from green (valid), yellow (caution), to red (alarm). DashBoard reports the most severe alarm for a single field. Alarm colors are noted within the tables as text set in brackets next to the menu parameter name.

Signal Tab

Table 6.1 summarizes the read-only information displayed in the **Signal** tab.

Table 6.1 Signal Tab Items

Tab Title	Item	Parameters	Description
Signal	Reference Status	OK (Green)	A valid reference signal is detected
		No Reference (Red)	No signal detected on the selected reference input
		Reference Unlocked (Red)	A reference signal is detected but the card is not locked to it
		Invalid Reference (Red)	A reference signal is detected but the format is incompatible with the current output mode
	Reference Format	Unknown	No signal present, or format is not supported
		#	Indicates the reference format detected
	Bkgd # Status	OK (Green)	Normal operation
		Alarm Suppressed (Green)	An alarm condition exists but is silenced
		Invalid Signal (Yellow)	Signal detected but format not recognized
		Incompatible format (Yellow)	Signal present but format does not match the video output format configuration of the card
		No signal (Red)	No signal present on the input
	Bypass Relay	Normal (not in bypass) (Green)	Video is being routed through the card; keyers may be active
		Active (in bypass) (Red)	When using the 8320AR-033 rear module, the BKGD A bypasses the card and is looped passively on OUT 1 through the relay. When using the 8320AR-061 rear module: <ul style="list-style-type: none"> • BKGD A bypasses the card and is looped passively on OUT 1 on one relay and, • BKGD B bypasses the card and is looped passively on OUT 2 on the second relay.
	Timing Display	Relative to Reference	The Bkgd Timing fields display the input signal timing values relative to the selected analog reference
		Input to Output	The Bkgd Timing fields display the input signal timing values relative to the SDI output of the card

Table 6.1 Signal Tab Items

Tab Title	Item	Parameters	Description
Signal	Bkgd # Timing	## Clocks ## lines	Indicates the timing of the specified input signal relative as configured in the Timing Display feature. Where 1 clock is 1 period of 27MHz (SD) or 1 period of 148.xMHz (HD).
		Green	The specified input signal is within the valid range
		Yellow	The specified input signal is outside the valid range; a vertical shift will occur ^a
		Grey	The specified input signal is not available
	Output Timing	## Clocks ## lines	Indicates the timing of the output signals relative to the reference

- a. The inputs on the card are line-synchronized. Therefore, in order to avoid vertical shifts of the video, the input signals must be timed within approximately +/- half a line.

Hardware Tab

Table 6.2 summarizes the read-only information displayed in the **Hardware** tab.

Table 6.2 Hardware Tab Items

Tab Title	Item	Parameters	Description
Hardware	Voltage (V)	#	Supply Voltage, in Volts
	Current (mA)	#	Current consumption of card in milliAmperes
	Power (W)	#	Power consumption of card in Watts
	FPGA Temp	##C ^a / ##F	FPGA core temperature
	CPU Usage	x.xx/y.yy/z.zz	Displays the CPU Load average where: <ul style="list-style-type: none"> • x.xx represents in the last minute • y.yy represents in the last five minutes • z.zz represents in the last fifteen minutes
	RAM Available	##/##	CPU Memory Used / Total CPU Memory
	CF Card Status	##.## of #GB used	Displays the amount of memory used on the CompactFlash® card
Missing or Unreadable		One of the following is occurring: <ul style="list-style-type: none"> • CompactFlash card is not present • An error has occurred such as incompatible CompactFlash card is installed, or an error in reading the card 	

Table 6.2 Hardware Tab Items

Tab Title	Item	Parameters	Description
Hardware	Playout RAM	a/b/c/d	Displays RAM memory usage where: <ul style="list-style-type: none"> • a represents the memory in use • b represents the memory cache from previously loaded files • c represents the memory dedicated to the frame sync buffers and related functions. Note that this memory is unavailable for images and animations. • d represents the total playout memory

- a. A warning is displayed in DashBoard when the FPGA Core Temperature reaches 85°C. If the temperature reaches 110°C, the card will automatically shut down to avoid permanent damage and will have to be reset, rebooted, or power cycled to resume normal operation.

Product Tab

Table 6.3 summarizes the read-only information displayed in the **Product** tab.

Table 6.3 Product Tab Items

Tab Title	Item	Parameters	Description
Product	Product	MDK-111A-K	Indicates the product name
	Supplier	Ross Video Ltd.	
	Board Rev	##	Indicates the board version of your card
	Serial Number	#####	Indicates the serial number of your card
	Rear Module	#	Type of rear module in this slot
	Software Rev	#. # build ###	Indicates the software and build versions
	Firmware Rev	##.##	Indicates the FPGA version number

Configuration Menus

This section briefly summarizes the sub-tabs available on the **Config** tab.

Video Tab

Table 6.4 summarizes the **Video** tab options available in DashBoard.

Table 6.4 Video Tab Options

Option	Item	Parameters	Description
Reference Setup	Reference Input	Frame 1*	Select this option to use the reference source connected to the FRAME REF 1 port on the openGear frame
		Frame 2	Select this option to use the reference source connected to the FRAME REF 2 port on the openGear frame
		External	Select this option to use the external reference source connected to REF IN on the rear module. Use J7 on the card to enable or disable a 75ohm terminator on the External Reference input. Refer to the section “ Card Overview ” on page 2-3 for details on J7 .
	Output Format	480i 59.94	Selects the video format for the output signal, Note that a change in video format will not take effect until the reference is compatible.
		720p 59.94	
		1080i 59.94	
		576i 50	
		720p 50	
		1080p 50/59.94 Level A/B	
		1080i 50	
1080PsF 24			
1080PsF 23.98			
Output Setup	Output # (read-only)	#	Indicates what the specified output is assigned to: <ul style="list-style-type: none"> • Output 1 is fixed to Program A • Output 2 is fixed to Program B • Output 3 is fixed to Program C • Output 4 is fixed to Program D
	Dithering	Disabled*	Dithering is disabled
		Enabled - low	Dithering is enabled and set to 2bits
		Enabled - med	Dithering is enabled and set to 3bits
		Enabled - high	Dithering is enabled and set to 4bits

Table 6.4 Video Tab Options

Option	Item	Parameters	Description
Output Setup	Clip at Black	Selected	Select this box to enable the card to clip to SMPTE black on all outputs
		Cleared*	SuperBlack is allowed
	Clip at White	Selected	Select this box to enable the card to clip to SMPTE white on all outputs
		Cleared*	SuperWhite is allowed
	NTSC Pass Line 21	Selected	Line 21 passes through unaltered. This setting should only be used when closed-captioning, or other data, is present on Line 21.
		Cleared*	Line 21 is treated as active video
Signal Loss Alarm	Bkgd #	Selected	An alarm is triggered when a missing or an invalid signal is detected on the specified input
		Cleared	The alarm is suppressed when a missing or an invalid signal is detected on the specified input

GPI Configuration

The menu items available in the **GPI/Tally** tab enable you to configure the functions, trigger, and polarity of each GPI connected to the MDK-111A-K.

Table 6.5 GPI Setup Menu Items

Option Title	Item	Parameter	Description
GPI #	Function	None*	The GPIO port is not configured and the GPI has no effect (default). The Trigger and Polarity settings are ignored.
		GPI Cut Key #	A cut transition is performed on the specified Key when a trigger is received by that GPI input
		GPI Auto Key #	An auto transition is performed to bring the key on-air or off-air when this GPI input is triggered
		Timecode Input	Select this option when this pin is used to communicate with an LTC device to input timecode. The Trigger and Polarity settings are ignored.

Table 6.5 GPI Setup Menu Items

Option Title	Item	Parameter	Description
GPI #	Trigger	Edge*	Performs the function when a transition edge is detected on the GPI input. Select this option to configure the card to perform the Function on either the Rising or Falling Edge of the GPI signal as determined by the Polarity setting.
		Level	Performs the function when a voltage level is driven on the GPI input. Select this option to have the GPI action controlled by a static voltage level. The card performs the Function when the GPI state is either High or Low as determined by the Polarity setting. The action triggered by the GPI input will remain in that state until the GPI level changes.
	Polarity	High/Rising	Sets the polarity of the edge or level trigger. In the case of edge trigger, a Low-to-High transition starts the function. In the case of level trigger, a high level starts the function.
		Low/Falling*	Sets the polarity of the edge or level trigger. In the case of the edge trigger, a High-to-Low transition starts the function. In the case of level trigger, a low level starts the function.

Tally Configuration

The menu items available in the **GPI/Tally** tab enable you to configure each Tally.

Table 6.6 Tally Setup Menu Items

Option Title	Item	Parameter	Description
Tally #	Function	None*	The GPI/O port is not configured and the tally has no effect. The Polarity setting is ignored.
		Tally Bkgd A	Configures the selected GPI/O port as an output (the tally is active) and reflects the on-air status of BKGD A.
		Tally Bkgd B	Configures the GPI/O port as an output and reflects the on-air status of BKGD B.
		Tally Bkgd C	Configures the GPI/O port as an output and reflects the on-air status of BKGD C.
		Tally Bkgd D	Configures the GPI/O port as an output and reflects the on-air status of BKGD D.
		Tally Key #	Configures the GPI/O port as an output and reflects the on-air status of the Key video.
		Tally Any Key	Configures the GPI/O port as an output; the Tally active when any of the Keys are on-air.

Table 6.6 Tally Setup Menu Items

Option Title	Item	Parameter	Description
Tally #	Polarity	High/Rising	When asserted, the Tally output is driven High (+5V)
		Low/Falling*	When asserted, the Tally output is driven Low (0V)

Remote Control Tab

Table 6.7 outlines the options available on the **Remote Control** tab.



Note — A protocol can only be active on the serial port, or on the ethernet port, but not both. Should you attempt to enable the same protocol on both ports, the card automatically disables the first port (the **Enabled** box is cleared).

Table 6.7 Remote Control Tab Items

Tab Title	Item	Parameter	Description
Serial Port ^a	Port Enabled	Selected	Enables the serial port on the rear module to communicate with a serial device
		Cleared*	Disables the serial port on the rear module. Any incoming data on the serial port is discarded by the card. The Bit Rate, Data Bits, Parity, and Stop Bits fields are ignored.
	Protocol	M-2100*	Select this option if you are using the GVG M-2100 protocol
		Timecode	Select this option if you are communicating with an LTC device. Refer to the section refer to the section “ LTC Communication Setup ” on page 3-12 for details.
		RossTalk	Select this option to use the RossTalk text-based protocol that enables control of Ross Video equipment. Refer to the RossTalk Commands Setup Sheet available on the Gear Documentation Disc for details.
	Port Type	RS 232	Select this option if the card is connected to an external device that uses the RS-232 (TIA/EIA-232) transmission standard
		RS 422	Select this option if the card is connected to an external device that uses the RS-422 (TIA/EIA-422) transmission standard. In this mode, the Rx receive end is terminated with a 120ohm resistor on the card.
		RS 422 unterm	Select this option if the card is connected to an external device that uses an unterminated RS-422 transmission standard. In this mode, the Rx receive end is not terminated on the card. This mode is used to daisy-chain several card Rx ports, where only the last one would be terminated. This setting is recommended when the Protocol is set to Timecode.

Table 6.7 Remote Control Tab Items

Tab Title	Item	Parameter	Description
Serial Port ^a	Port Type	RS 422 NULL	Select this option if the card is connected to an external device that uses the standard RS-422 transmission standard with a null pinout. In this mode, the Rx and Tx are swapped on the card port and the Rx receive end is terminated with a 120ohm resistor on the card.
		RS 422 NULL unterm	Select this option if the card is connected to an external device that uses the standard RS-422 unterminated transmission standard with a null pinout. In this mode, the Rx and Tx are swapped on the card port and the Rx receive end is not terminated on the card. Use this mode to daisy-chain several card Rx ports, where only the last one would be terminated.
		None*	No transmission standard is specified
	Bit Rate	9600	Selects the bit rate for the external device connected to the Serial port
		19200	
		38400	
		57600	
		115200	
	Data Bits	7	Sets the number of data bits transmission (character length)
		8	
	Parity	None	Sets the Parity type
		Even	
		Odd	
Stop Bits	1	Sets the number of stop bits transmission	
	2		
Ethernet Port ^b	Enabled	Selected	Enables the protocol on the Ethernet port
		Cleared*	Disables the specified communication protocol on the ethernet port. When the check box is cleared, any incoming data from the serial device is discarded by the card.
	Protocol	TCP*	Select this option if your device is connected to the card through a network and uses the Transmission Control Protocol (TCP/IP)
		UDP	Select this option if your device is connected to the card through a network and uses the User Datagram Protocol (UDP/IP)
	Port	1-32767 ^c	Specifies the port address. The TCP ports 0, 21, 22, 80, and 6667 are unavailable for serial communications.

- a. The default values for the Serial Port parameters, bit rate, data bits, parity, and stop bits, are protocol dependent.
- b. Each ethernet protocol is listed as a separate row in the Ethernet Port area of the tab.
- c. The default value is 9000.

Ethernet Tab

The **Ethernet** tab enables you to set up network communications for your card.

Table 6.8 Ethernet Tab Items

Tab Title	Item	Parameter	Description	
Ethernet	Method	Static	User manually supplies the Ethernet settings	
		DHCP*	Automates the assignment of the Ethernet settings	
	IP Address	###.###.###.###	The IP Address for the card	
	Subnet Mask	###.###.###.###	The subnet mask for the card	
	Default Gateway	###.###.###.###	The gateway for communication outside of the local area network (LAN)	
	Apply Changes		Applies and saves any changes made to the Ethernet Settings	
	Cancel		Cancel any setting changes and resets the Ethernet Settings to the previous values	
	Ethernet Status (read-only)	OK		Ethernet communications for the card are valid
		Link Down		Ethernet communications for the card are invalid. The ethernet cable may be disconnected on the rear module or the ethernet network may be down or experiencing problems.
		No IP Address		The following conditions are occurring: <ul style="list-style-type: none"> • The Method is set to DHCP. • The ethernet cable connected to card rear module is connected. • A valid IP address could not be obtained. The DHCP server may be down or is still powering up after a power outage.
MAC Address (read-only)	##:##:##:##:##:##		The MAC Address for the card	

Personality Tab

The menu items available in the **Personality** tab enable you to specify the transition behavior of the buttons available in the **On Air Controls** tab, specify how the timing status fields report, and configure editing permissions for the MDK-111A-K.

Table 6.9 Personality Tab Items

Option Title	Item	Parameter	Description
Transition Behavior	Cut Button	Abort*	Select this option to return the transition to the beginning when the Cut button is pressed again while a transition is in progress
		Finish	Select this option to instantly finish the transition when the Cut button is toggled
		Ignore	Select this option to disregard any successive presses of the Cut button until the transition is complete
	Auto Button	Pause/Resume*	Select this option to pause the transition when the Auto button is toggled, and resume the transition when the button is pressed again
		Reverse	Select this option to reverse the transition back to the start
		Ignore	Select this option to disregard any successive presses of the Auto button until the transition is complete
Timing Display	Timing Display	Relative to Reference*	The Input Timing fields in the Signal tab display the timing values relative to the reference
		Input to Output	The Input Timing fields in the Signal tab display the timing values relative to the output
Card Lock	Edit Permission	Unlocked*	Select this option to enable card parameters to be edited from DashBoard
		Locked	Select this option to lock all the card parameters to read-only except this one. The card can still be controlled by GPI and/or external device commands if these were enabled prior to locking the card.

Load/Save Tab

The menu items available in the **Load/Save** tab enable you to reset menu parameters for the card to the factory default values.

Table 6.10 Load/Save Tab Items

Option Title	Item	Parameter	Description
Global Settings	Load Factory Defaults		Resets all DashBoard parameters and values (excluding ethernet, reference, and output format settings) to the factory default values

Proc Amps Tab

Table 6.11 summarizes the Proc Amps tab options available in DashBoard. Each output has a sub-tab to select which output is to be modified.

Table 6.11 Proc Amps Options

Option Title	Item	Parameters	Description
Output #	Enable	Selected	Enables the adjustment of Proc Amp settings for the selected output
		Cleared*	The Proc Amp settings for the selected output are inactive
	Video Gain (%)	0 to 200 ^a	Adjusts the Chroma and Luma Gain values simultaneously
	Chroma Gain (%)	0 to 200 ^b	Adjusts the Cr and Cb values of the output video signals: <ul style="list-style-type: none"> Increasing the gain increases the saturation of colors Decreasing the gain desaturates the colors until the signal is black and white
	CB Gain (%)	0 to 200 ^c	Adjusts the Cb component of the chrominance video signal: <ul style="list-style-type: none"> Increasing the value causes the video signal colors to become increasingly saturated with blue Decreasing the value de-saturates blue from the video signal
	Black Offset (IRE)	-8 to 100 ^d	Selects how much of the input video signal values are mapped to black in the output signal: <ul style="list-style-type: none"> Increasing the value increases the black level and lightens the image Decreasing the value darkens the image
	Proc Amp	Reset	Resets the Proc Amp menu settings for the selected output to the default values

- a. The default value is 100.
- b. The default value is 100.
- c. The default value is 100.
- d. The default value is 0.

Logos Tab

Table 6.12 summarizes the **Logos** tab options available in DashBoard. Each logo has a sub-tab to select which logo is to be modified.

Table 6.12 Logos Options

Option Title	Item	Parameters	Description
Logo #	Video Image	Displays a thumbnail image	<ul style="list-style-type: none"> Displays a small image that represents the currently loaded media file. For animations, the fifth frame is displayed. Only available when the card ethernet port is connected and properly configured A black box with text indicates that no image is currently loaded
	Alpha Image	Displays a thumbnail image	<ul style="list-style-type: none"> Displays a small image that represents the currently loaded media file on the Alpha channel. For animations, the fifth frame is displayed. A blank area indicates that the current image has no alpha channel
	File	xxx_####.yyy	<ul style="list-style-type: none"> Indicates the full path of the currently loaded file #### represents the duration of the file if it is an animation
	Status	Loading frame X of Y	<ul style="list-style-type: none"> Displays information about the channel in both the number of frames (integer), and in the number of seconds (fractional) Any errors during loading are also displayed When the file(s) have loaded, this field displays the dimensions of the image (e.g. 1920x1080)
		Animation loaded (#)	
		Single image loaded (#)	
		Idle	
	Selected on (read-only)	###	Indicates all the key(s), or backgrounds, that currently have the media file selected
		None	
	On Air (read-only)	###	Indicates the on-air key(s), or backgrounds, that have this media file selected
Directory	[PATTERNS]	Provides a list of virtual files loaded in the card memory, such as timecode information	
	[RAM CACHE]	<ul style="list-style-type: none"> The field displays the directory the currently selected media file is located in Provides a list of all of the directories on the CompactFlash Card 	
	[ROOT]*		
	###	<ul style="list-style-type: none"> Displays the total memory usage of the RAM CACHE 	

Table 6.12 Logos Options

Option Title	Item	Parameters	Description
Logo #	Filename	xxx.yyy xxx_####.yyy	<ul style="list-style-type: none"> Displays the name of the currently selected media file Animation filenames include an underscore followed by three or more digits. The number of frames, and duration in seconds, is displayed in brackets after the filename. Updated when a new Directory is selected in the Directory menu Provides a list of all the media files in the currently selected directory. Note that animations appear as a single entry.
		[NONE]	Selecting this option clears the logo channel. This item is automatically selected, without clearing the channel, when the user switches to a new directory
	File List	Rescan	Pressing the button: <ul style="list-style-type: none"> updates the Directory menu options updates the Filename menu options
	X Position	## to ## ^a	<ul style="list-style-type: none"> Adjusts the position of the image along the X-axis in number of pixels The range varies depending on the output video format
	Y Position	## to ## ^a	<ul style="list-style-type: none"> Adjusts the position of the image along the Y-axis in number of pixels The range varies depending on the output video format
	Play Mode	Normal	The entire frame of the image is displayed
		Swap Fields	Field 1 and Field 2 of the image are swapped when they are displayed
		Field 1 Only	Field 1 of the image is displayed
		Field 2 Only	Field 2 of the image is displayed
	Auto Play ^b	Selected*	The animation starts to play when a transition occurs
		Cleared	The animation starts playing as soon as the animation is loaded to the bus
	Looping ^c	Selected*	The animation starts over when it reaches the last frame of the animation
		Cleared	The animation stops when it reaches the last frame of the animation
	Hold Time	# ^d	The animation plays but before looping back (if looping is enabled), it pauses on the last frame, for the specified number of frames.

- a. The default value is 0 which represents the top-left corner of the active picture area.
b. This option is only applicable when an animation file is selected.
c. This option is only applicable when an animation file is selected.
d. The default is 0.

Key Setup Menus

Table 6.13 summarizes the **Key Setup** tab options available in DashBoard. Each key has a sub-tab to select which key is to be modified.

Table 6.13 Key Setup Menu Items

Option Title	Item	Parameters	Description	
Key #	Clip	4 to 1019 ^a	Adjusts the luminance level of the key. The lower the threshold setting, the more the Key is visible	
	Gain	0 to 100 ^b	Adjusts the softness of the edges of the key	
	Clip & Gain	Make Linear	Resets the clip and gain values to the default settings	
	Key Invert	Selected		The polarity of the Key Alpha is inverted. Note that a Key Invert can be applied to any key type.
		Cleared*		The Key Alpha is not inverted
	Key Type	Auto Select*		A Key which two video signals (Alpha and Fill) are used
		Self		A Key that uses the luminance values of the key source for the alpha
	Key Alpha Type	Unshaped		Select this option to set the Key Alpha to unshaped. With an Unshaped Key, the Key Alpha luminance value mixes linearly the Key Video with the Background. Shades of gray, in the Key Alpha, are translated into transparency levels, giving the key a soft edge. Self Keys are set to Unshaped by default.
		Shaped*		Select this option to set the Key Alpha to shaped. With a Shaped Key, the Key Alpha cuts a hole in the Background based on the luminance value of the Key Alpha and adds the Key Video to the Background hole. Shaped Key alphas are sometimes used with Character Generators to cut very precise holes for the Key Video fill.
	Transparency	0 to 100 ^c	Adjusts the transparency level of the key where: 0% — The key is completely opaque. At this value, there is no difference between the original key and the key with the transparency effect applied to it 100% — The key is completely transparent. At this value, the key is not visible on the screen	

Table 6.13 Key Setup Menu Items

Option Title	Item	Parameters	Description
Key #	Box Mask	Off*	Disables this feature; a mask is not applied to the key
		On	Applies the mask to the key. The key is masked, only the portion inside the box is displayed.
		Inverted	Reverses the mask. The portion of the image that was masked is now visible and the portion that was visible is now masked.
	Mask Top Edge	0 to # ^d	Adjusts the location of the top edge of the mask
	Mask Bottom Edge	0 to # ^d	Adjusts the location of the bottom edge of the mask
	Mask Left Edge	0 to # ^d	Adjusts the location of the left edge of the mask
	Mask Right Edge	0 to # ^d	Adjusts the location of the right edge of the mask

- a. The default value is 940.
- b. The default value is 50.
- c. The default value is 0.
- d. The range of values are dependent on the video format.

On Air Control Tab

Table 6.14 summarizes the **On Air Control** options available in DashBoard.

Table 6.14 On Air Control Options

Option Title	Item	Parameters	Description	
Program A	Image	Displays a thumbnail image	Displays a thumbnail image that represents the BKGD source	
	Key Status (read-only)	ON AIR		Program A is on-air
		OFF AIR		Program A is not on-air
	Bkgd Source	Black		Assigns Black as the program output
		Bkgd #		Assigns the selected input source as the program output
		Logo #		Assigns the selected Logo media file as the program output
		Alpha #		<ul style="list-style-type: none"> • Assigns the Alpha from the specified Logo • Black is displayed if there is no Logo loaded or if the Logo does not have an alpha channel
	Key Source	Black		Assigns Black as the preview output
		Bkgd #		Assigns the selected BKGD source as the preview output
		Logo #		Assigns the selected Logo media file as the preview output
		Alpha #		<ul style="list-style-type: none"> • Assigns the Alpha from the specified Logo • Black is displayed if there is no Logo loaded, or if the current Logo does not have an alpha channel
	Cut	Cut		Performs an instantaneous transition between the BKGD sources selected in the Source and Preview areas
	Auto	Auto		Performs the transition, as specified in the Auto Trans Type menu, between the BKGD sources selected in the Source and Preview areas, at the Bkgd rate
	Lock Keyers	Selected		When locked, the key transition and states are locked. Selecting a Cut or Auto button transitions all keys at the same time.
Cleared*			When unlocked, the key transition and states are separate. Selecting a Cut or Auto button transitions only the selected key.	

Table 6.14 On Air Control Options

Option Title	Item	Parameters	Description
Program #	Image	Displays a thumbnail image	Displays a thumbnail image that represents the Key source
	Key Status (Read-only)	ON AIR	The key is on-air
		OFF AIR	The key is not on-air
	Bkgd Source	Black	Assigns Black as the program output
		Bkgd #	Assigns the selected input source as the program output
		Logo #	Assigns the selected Logo media file as the program output
		Alpha #	<ul style="list-style-type: none"> Assigns the Alpha from the specified Logo Black is displayed if there is no Logo loaded or if the Logo does not have an alpha channel
	Key Source	Black	Assigns Black as the Key output
		Input #	Assigns the selected input source as the Key output
		Logo #	Assigns the selected Logo media file as the Key output
		Alpha #	Assigns the Alpha from the specified Logo
Cut	Cut	Performs an instantaneous transition to take the Key on-air or off-air	
Auto	Auto	Performs a dissolve to transition the key on or off air. The speed of the transition is controlled by the Key Rate setting.	
Transition Rates	Key Rate	Slow	Sets the key transition rate to Slow
		Medium	Sets the key transition rate to Medium
		Fast*	Sets the key transition rate to Fast
	Slow Rate	1 to 999 ^a	Defines the Slow Rate in frames
	Medium Rate	1 to 999 ^b	Defines the Medium Rate in frames
	Fast Rate	1 to 999 ^c	Defines the Fast Rate in frames

- a. The default value is 60 frames (2 seconds) when using 59.94Hz formats. When using 50Hz formats, the default value is 50 frames.
- b. The default value is 30 frames (1 second) when using 59.94Hz formats. When using 50Hz formats, the default value is 25 frames.
- c. The default value is 15 frames (0.5 second) when using 59.94Hz formats. When using 50Hz formats, the default value is 12 frames.

Appendix A. Serial Protocols

In This Appendix

This appendix describes the communications protocol systems used with the MDK-111A-K.

The following topics are discussed:

- GVG M-2100 Emulation Protocol

GVG M-2100 Emulation Protocol

The MDK-111A-K serial interface provides a communication link between a computer based editing or automation system and the MDK-111A-K. This section briefly outlines the GVG M-2100 emulation protocol system when used with the MDK-111A-K.

For specific details on the protocol, refer to your *GVG M-2100 Automation Interface Protocol Manual*.



Note — *Using the GVG M-2100 protocol may cause the card to enter a condition where DashBoard may not properly reflect the current status of the card.*

Pinout Connections

When connecting to a device using the GVG M-2100 protocol, refer to the section “**Serial Port Pin Assignment**” on page 2-9 for pinout information for the **Serial COM** port. Refer to the documentation that came with your M-2100 protocol device for specific pinout information.

Communication Settings

Unless otherwise stated by the GVG M-2100 Automation Interface Protocol Manual, use the following communication settings when connecting a GVG M-2100 protocol device to the MDK-111A-K.

Table 7.1 GVG M-2100 Communication Settings

Setting	Value
Baud	38400bps
Data Bits	8
Parity	None
Stop Bits	1



Note — *The MDK-111A-K allows the GVG M-2100 protocol to be transported over TCP or UDP ethernet rather than by the serial port. Refer to the refer to the section “Ethernet Port Cabling” on page 2-10 for cabling details.*

Emulation Commands

This section provides a brief overview of the M-2100 emulation commands supported by the MDK-111A-K.

Table 7.2 Supported GVG M-2100 Emulation Commands

Emulation Command	Supported	Notes
Next Transition (0x01, TX_NEXT)	✓	<ul style="list-style-type: none"> • Either bit 0, or bit 1, or both must be selected. • Bit 00 is ignored.
Start Transition (0x02, TX_START)	✓	Trigger Mod Bit 1-7 are ignored/reserved.
Select Transition Type (0x03, TX_TYPE)	✓	The card does not support wipes. If a wipe transition is selected, the card returns an error. The card does not support custom transitions.
Select Transition Rate (0x04, TX_RATE)	✓	The card supports Slow, Medium, and Fast Rates, selectable in DashBoard, and not based on the transition type selected. The Rate type 04 byte value will not be returned by the card. Note that the maximum transition rate is 999 frames.
Transition Status (0x05, TX_STAT)		<ul style="list-style-type: none"> • Not currently supported. The card always returns 03. • Audio is quiescent (01).
Transition Status (0x15, TX_STAT2)		<ul style="list-style-type: none"> • Not currently supported. The card always returns 03. • Audio is quiescent (01).
Crosspoint Take (0x06, XPT_TAKE)	✓	<ul style="list-style-type: none"> • Bus Select Bit values 2-15 are ignored/reserved. • Crosspoint byte values 01-16 designate the crosspoint number. • Audio Only Crosspoint byte value is not supported. • Hot cuts (XPT-Take, 0x06) are not allowed when a transition is in progress. • Refer to Table 7.3 for details on crosspoint mapping.
Break Away (0x07, BREAK_AWAY)		Not currently supported.
Audio Over Select (0x08, OVER_SELECT)		Not currently supported.
Audio Over to Main Ratio (0x09, OVER_RATIO)		Not currently supported.
Key Modifier (0x0A, KEY_MOD)	✓	<p>Keyer Select byte value: Bit 4 is not supported</p> <p>Keyer Modifier byte value is supported as follows:</p> <ul style="list-style-type: none"> • Bit 0 where 0 = Self, 1 = External • Bit 1 is not supported • Bit 2-4 is ignored <p>SqueezeBack byte value is not supported.</p>
Key Enable (0x0B, KEY_ENABLE)	✓	Bit 4 is not currently supported.
Key Status (0x0C, KEY_STAT)	✓	Bit 4 is not currently supported.
Automation Enable Status (0x0D, AUTO_STAT)	✓	This command sends an Enabled reply to a Status query. On the card, the Automation interface can be disabled on the DashBoard Remote tab by clearing the Port Enabled check box. If you disable the Automation interface, there will be no response to commands including this one.

Table 7.2 Supported GVG M-2100 Emulation Commands

Emulation Command	Supported	Notes
Stop Ongoing Transition (0x0E, ALL_STOP)		Not currently supported.
Current Preroll Time (0x0F, PREROLL)		Not currently supported.
Configuration Preroll Time (0x10, CONFIG_PREROLL)		Not currently supported.
Remaining Time Display (0x11, REMAINING_TIME)		Not currently supported.
System Status (0x12, SYSTEM_STAT)	✓	This reply returns only a value of 0, indicating an “OK” condition.
System Configuration (0x13, SYSTEM_CONFIG)	✓	This reply returns only a value of 0, indicating an “OK” condition.
Crosspoint Audio Mode (0x14, XPT_AUDIO_MODE)		Not currently supported.
GPI Button Operation (0x17, GPI)		Not currently supported.
Select Wipe Patterns (0x18, WIPE_SEL)		Not currently supported.
Error Status (0x20, ERROR_STAT)	✓	This query should only be issued after a NAK was received from the card or the card did not perform the desired action. If no errors have occurred since the last message was received by the card, an error code of NO_ERR is returned.
Protocol/Version (0x21, PROTO_VER)	✓	Protocol version is set to 3.0.

Crosspoint Take (0x06, XPT_TAKE)

Table 7.3 provides a list of crosspoints for the XPT_TAKE command. Note that values not listed in this table are undefined and are not recommended for use.

Table 7.3 Crosspoint Take (0x06, XPT_TAKE)

Selecting Crosspoint	Selects
0x00	No Change
0x01	Black
0x05	IN 1
0x06	IN 2
0x07	Key Video
0x08	Key Alpha
0x09	Logo 1
0x0a	Alpha 1
0x0b	Logo 2
0x0c	Alpha 2
0x0d	Logo 3
0x0e	Alpha 3

Table 7.3 Crosspoint Take (0x06, XPT_TAKE)

Selecting Crosspoint	Selects
0x0f	Logo 4
0x10	Alpha 4

Protocol Extensions

The following message types have been added for the MDK-111A-K. However, these types are not part of the official GVG M-2100 protocol. Contact Ross Video if any of these extensions cause compatibility issues for your GVG M-2100 equipment.

Loading an Image into a Logo Channel

This command can be used to trigger the loading of an image or animation from the CompactFlash™ card into a specific Logo channel. Note that in many cases, the RossLinq protocol (refer to the section “**Connection using RossLinq**” on page 5-6) is recommended for bringing remote content directly into a Logo channel.

ROSS_LOGO - Trigger image load

value: 0x30 (unsigned byte)

command format: ROSS_LOGO <channel> <filename>

query_format: illegal

reply format: always returns ACK

notes: This command is equivalent to selecting a new file to be loaded into a Logo channel through the normal DashBoard interface. The card will begin loading the specified file, which could take anywhere from one field (if the file is already in cache) to many minutes (for large animations). The GVG M-2100 protocol will respond immediately with an ACK, without waiting for the image loading to complete. There is currently no way to know when loading is complete, other than to monitor the status in DashBoard.

field information: <channel> this is a channel number in the range 0 to 3, corresponding to Logo channels 1-4 in the normal DashBoard interface. Only the two least-significant bits of this field are used; the upper 6 bits are ignored.

<filename> is the full filename of the image to be loaded, including any directory names. The directory separator is a forward slash ("/") character.

- This field should consist of plain ASCII characters in the range 32-127. There should not be any control characters or NULL bytes. Extended character sets including Unicode may work but have not been specifically tested.
- Maximum filename length is dictated by GVG M-2100 protocol limits: a message may not exceed 256 bytes, so the maximum filename length is around 245 bytes. Longer names may cause problems, this has not been tested.

The following example demonstrates how to load a file called “Shaped.png” located in the directory “anim” into Logo Channel 1.

AUTO->M2100

[02] STX Start of message

[93]	Byte count	Message byte count
[01]	CMD	Classification Command to follow
[91]	Byte count	Message byte count
[30]	ROSS_LOGO	Initiate Logo load
[00]	<channel>	Load into Logo channel 1
[61 6e 69 6d 2f 53 68 61 70 65 64 2e 70 6e 67]	<filename>	anim/Shaped.png
[0f]	Checksum	Message Checksum
M2100->AUTO		
[04]	ACK	Message accepted, image loading starts

Appendix B. Specifications

In This Appendix

This appendix provides information on the specifications for your MDK-111A-K. Note that specifications are subject to change without notice.

The following topics are discussed:

- Technical Specifications

Technical Specifications

This section includes the technical specifications for the MDK-111A-K based on the rear module.

8320AR-033 Rear Module

Table 8.1 provides the technical specifications when using the 8320AR-033 rear module.

Table 8.1 Technical Specifications — 8320AR-033 Rear Module

Category	Parameter	Specification
SDI Inputs	Number of Inputs	4
	SDI Data Rates and SMPTE Standards Accommodated	<ul style="list-style-type: none"> • SMPTE 259M (270Mbps) • SMPTE 292M (1.485Gbps)
	Impedance	75ohms
	Return Loss	SDI IN 1: 15dB to 1.5GHz SDI IN 2-4: >15dB to 1.5GHz
	Equalization	80m
SDI Outputs	Number of Outputs	4
	Impedance	75ohms
	Return Loss	SDI OUT 1: 15dB to 1.5GHz SDI OUT 2-4: >15dB to 1.5GHz
	Signal Level	800mV +/-10%
	DC Offset	0+/-50mV
	Rise and Fall Time	SD: 900ps typical HD: 150ps typical
	Overshoot	<10% typical
Cable Lengths	RS-232 Serial Interface Maximum Cable Length	10m
	RS-422 Serial Interface Maximum Cable Length	300m
Environment	Maximum ambient temperature with a 1RU space above frame	40°C (104°F)
	Maximum ambient temperature without a 1RU space above frame	35°C (95°F)
Power	Power Consumption	22W

8320AR-061 Rear Module

Table 8.2 provides the technical specifications when using the 8320AR-061 rear module.

Table 8.2 Technical Specifications — 8320AR-061 Rear Module

Category	Parameter	Specification
SDI Inputs	Number of Inputs	4
	SDI Data Rates and SMPTE Standards Accommodated	<ul style="list-style-type: none"> • SMPTE 259M (270Mbps) • SMPTE 292M (1.485Gbps)
	Impedance	75ohms
	Return Loss	SDI IN 1, 2: >10dB to 1.5GHz SDI IN 3, 4: >15dB to 1.5GHz
	Equalization	80m
SDI Outputs	Number of Outputs	4
	Impedance	75ohms
	Return Loss	SDI OUT 1, 2: >10dB to 1.5GHz SDI OUT 3, 4: >15dB to 1.5GHz
	Signal Level	800mV +/-10%
	DC Offset	0+/-50mV
	Rise and Fall Time	SD: 900ps typical HD: 150ps typical
	Overshoot	<10% typical
Cable Lengths	RS-232 Serial Interface Maximum Cable Length	10m
	RS-422 Serial Interface Maximum Cable Length	300m
Environment	Maximum ambient temperature with a 1RU space above frame	40°C (104°F)
	Maximum ambient temperature without a 1RU space above frame	35°C (95°F)
Power	Power Consumption	22W

Appendix C. Software Licenses

In This Appendix

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zlib

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Appendix D. Service Information

In This Appendix

This appendix contains the following sections:

- Troubleshooting Checklist
- Warranty and Repair Policy

Troubleshooting Checklist

Routine maintenance to this openGear product is not required. In the event of problems with your MDK-111A-K, 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 openGear 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. **Reference Signal Status** — Verify that the analog reference (blackburst or tri-level) is supplied on one of the three reference inputs. Check the Reference Input and the Output Format settings. Also check the status of the reference by navigating to the Reference Status field located on the Signal tab in DashBoard.
4. **Input Signal Status** — Verify that source equipment is operating correctly and that a valid signal is being supplied.
5. **Output Signal Path** — Verify that destination equipment is operating correctly and receiving a valid signal.
6. **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 MDK-111A-K are 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 MDK-111A-K 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 MDK-111A-K 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 User Manual provides all pertinent information for the safe installation and operation of your openGear Product. Ross Video policy dictates that all repairs to the MDK-111A-K 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 MDK-111A-K, 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 MDK-111A-K. If required, a temporary replacement frame 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.

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Telephone: +1 613 • 652 • 4886
After Hours Emergency: +1 613 • 349 • 0006
Email: techsupport@rossvideo.com

General Information

Telephone: +1 613 • 652 • 4886
Fax: +1 613 • 652 • 4425
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Website: <http://www.rossvideo.com>

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