MC1 Master Control

MDK-111A-M User Guide

ROSS

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1. Provide a Superior Customer Experience
   - offer the best product quality and support
2. Make Cool Practical Technology
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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
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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-M · User Guide

- Ross Part Number: **111AMDR-004-06**
- Release Date: August 23, 2023.

The information contained in this Guide is subject to change without notice or obligation.

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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.

Notice

The material in this manual is furnished for informational use only. It is subject to change without notice and should not be construed as commitment by Ross Video Limited. Ross Video Limited assumes no responsibility or liability for errors or inaccuracies that may appear in this manual.

Safety Notices

Refer to the "**Important Regulatory and Safety Notices**" document that accompanied your product.

Statement of Compliance

This product has been determined to be compliant with the applicable standards, regulations, and directives for the countries where the product is marketed.

Compliance documentation, such as certification or Declaration of Compliance for the product is available upon request by contacting techsupport@rossvideo.com. Please include the product; model number identifiers and serial number and country that compliance information is needed in request.

EMC Notices

US FCC Part 15

This equipment has been tested and found to comply with the limits for a class A Digital device, pursuant to part 15 of the FCC Rules.

These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a Commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

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

Canada

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

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

European Union

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

Warning — *This equipment is compliant with Class A of CISPR 32. In a residential environment this equipment may cause radio interference.*

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 "**Contacting Technical Support**" section 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 "**Warranty and Repair Policy**" in this manual for details.

Environmental Information

The equipment may contain hazardous substances that could impact health and the environment.

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

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

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

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Introduction

This guide covers the installation, configuration, and use of the MDK-111A-M. The following chapters are included:

* "**Introduction**" summarizes the guide and provides important terms, and conventions.
* "**Before You Begin**" provides general information to keep in mind before installing and configuring your card.
* "**Hardware Overview**" provides a basic introduction to the hardware features including the cabling and monitoring features of the rear module.
* "**Physical Installation**" provides instructions for the physical installation of the card and its rear module, and provides information on connecting to your facility network.
* "**Cabling**"
* "**Getting Started**" provides a general overview of the user controls available on the MDK-111A-M.
* "**Configuration**" provides instructions for configuring the MDK-111A-M via DashBoard.
* "**Operation**" provides a summary of the operational features, such as Proc Amp controls, Key Setup, and performing transitions in DashBoard.
* "**Media File Management**" provides information on managing the images and animations using the DashBoard options available for the MDK-111A-M.
* "**Upgrading the Software**" provides instructions for upgrading the software for your MDK-111A-M using DashBoard.
* "**DashBoard Menus**" summarizes the MDK-111A-M menus, items, and parameters in DashBoard.
* "**Serial Protocols**" outlines how to configure the MDK-111A-M to communicate via the GVG M-2100 Emulation Protocol.
* "**Technical Specifications**" provides technical specification details on the MDK-111A-M.
* "**Software Licenses**" provides third-party software license information for your card.
* "**Service Information**" provides information on the warranty and repair policy for your card.
* "**Glossary**" provides a list of terms used throughout this guide.

Related Publications

It is recommended to consult the following Ross documentation before installing and configuring your MDK-111A-M card:

* *DashBoard User Guide*, Ross Part Number: 8351DR-004
* *MFC-OG3-N and MFC-8322-S User Guide*, Ross Part Number: 8322DR-004
* *OG3-FR Series User Guide*, Ross Part Number: 8322DR-005
* *OGX-FR Series User Guide*, Ross Part Number: 8322DR-204

Documentation Conventions

Special text formats are used in this guide to identify parts of the user interface, text that a user must enter, or a sequence of menus and sub-menus that must be followed to reach a particular command.

Interface Elements

Bold text is used to identify a user interface element such as a dialog box, menu item, or button. For example:

In the **Network** tab, click **Apply**.

User Entered Text

Courier text is used to identify text that a user must enter. For example:

In the **Language** box, enter `English.`

Referenced Guides

Text set in bold and italic represent the titles of referenced guides, manuals, or documents. For example:

For more information, refer to the ***DashBoard User Manual***.

Menu Sequences

Menu arrows are used in procedures to identify a sequence of menu items that you must follow. For example, if a step reads "**File** > **Save As**," you would click the **File** menu and then click **Save As**.

Important Instructions

Star icons are used to identify important instructions or features. For example:

✸ Contact your IT department before connecting 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 your device.

Contacting Technical Support

At Ross Video, we take pride in the quality of our products, but if problems occur, help is as close as the nearest telephone.

Our 24-hour Hot Line service ensures you have access to technical expertise around the clock. After-sales service and technical support is provided directly by Ross Video personnel. During business hours (Eastern Time), technical support personnel are available by telephone. After hours and on weekends, a direct emergency technical support phone line is available. If the technical support person who is on call does not answer this line immediately, a voice message can be left and the call will be returned shortly. This team of highly trained staff is available to react to any problem and to do whatever is necessary to ensure customer satisfaction.

• **Technical Support**: (+1) 613-652-4886
• **After Hours Emergency**: (+1) 613-349-0006
• **E-mail**: techsupport@rossvideo.com
• **Website**: http://www.rossvideo.com

Before You Begin

This chapter provides general information to keep in mind before installing and configuring your MDK-111A-M card.

Overview

The MDK-111A-M is a high quality HD/SD-SDI video keyers with four internal static/animation playout channels and one external key/alpha channel. An excellent device for keying external devices such as character generators, and graphic systems into a program feed and/or keying with four internal logo channels.

The MDK-111A-M offers full key control with shaped and unshaped keying, self key or auto key, and gain and clip control. The Background A and B inputs allows for background dissolves and V-Fades behind the external key source. All four inputs have line synchronization, locked to an external analog reference, to ease system timing requirements. Four independent outputs for Program, Preview, and Clean Feed offer independent Proc-Amp control with Fade to Black capability.

The MDK-111A-M processes embedded audio on the Background A and Background B inputs. Any audio groups present on the inputs are carried through to the outputs. During transitions, the audio ramps smoothly between A and B sources, matching the video transition.

Features

The following features are included:

- Compliance with SDI 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
- A/B Mix, V-Fade, Take-Fade, Fade-Take or Cut with external key
- Four SDI inputs that include two background inputs (A, B), External Key Video, and External Key Alpha
- Fade to Black function
- Four SDI outputs that may be configured as PGM, Preview, or Clean Feeds
- Passes audio, on the Background, to the Program and Preview outputs
- Eight bi-directional ports that are user programmable to be a GPI or a Tally
- Bypass relay from BKGD A to OUT 1
- 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
- Ethernet 10/100Mbit 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

- Remote serial control of the card using the M-2100 protocol
- Supports SNMP alarms for the input and reference signals
- Fully compliant with openGear specifications
- 5 year transferable warranty

Functional Block Diagram

Figure 1 is a functional block diagram of the MDK-111A-M with the 8320AR-033 rear module.
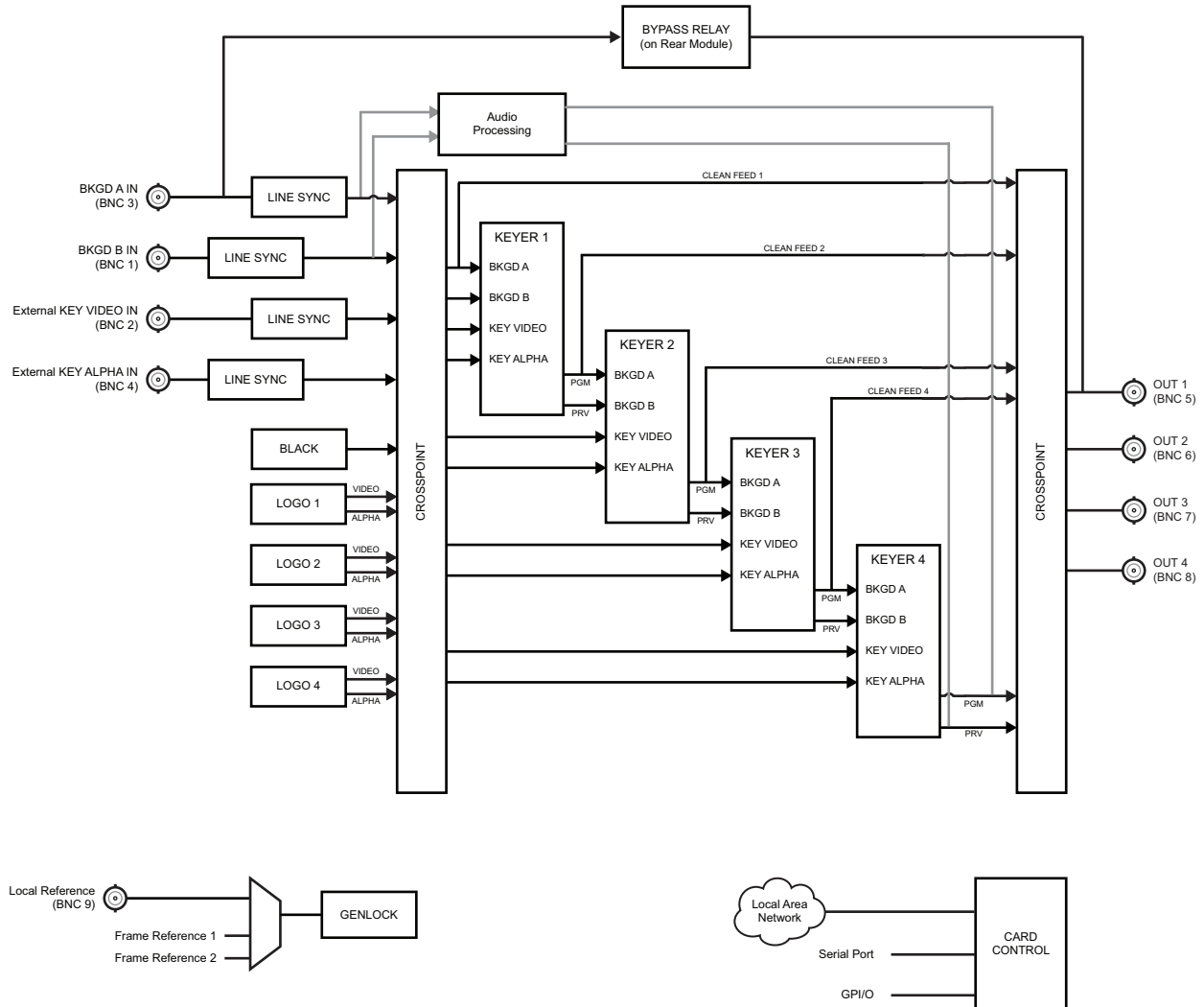
Figure 1 MDK-111A-M Block Diagram — 8320AR-033 Rear Module

User Interfaces

The MDK-111A-M 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 frame through the Network Controller Card. This controller card is required in order to use DashBoard to monitor the MDK-111A-M.

For More Information on...

- setting up the Network Controller Card, refer to its user manual.
- using DashBoard, refer to the ***DashBoard Control System User Manual***.
- the tabs and menus available for the MDK-111A-M in DashBoard, refer to "**DashBoard Menus**".

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 "**Card Overview**".
- card-edge LEDs, refer to "**Card-edge LEDs**".

SNMP Monitoring

The Network Controller cards in the openGear frame provide 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 ***MFC-8300 Series*** or ***MFC-OG3 Series User Manual***.

Hardware Overview

This chapter provides a basic introduction to the hardware features including the cabling and monitoring features of the supported rear modules.

Card Overview

This section provides an overview of the MDK-111A-M components.
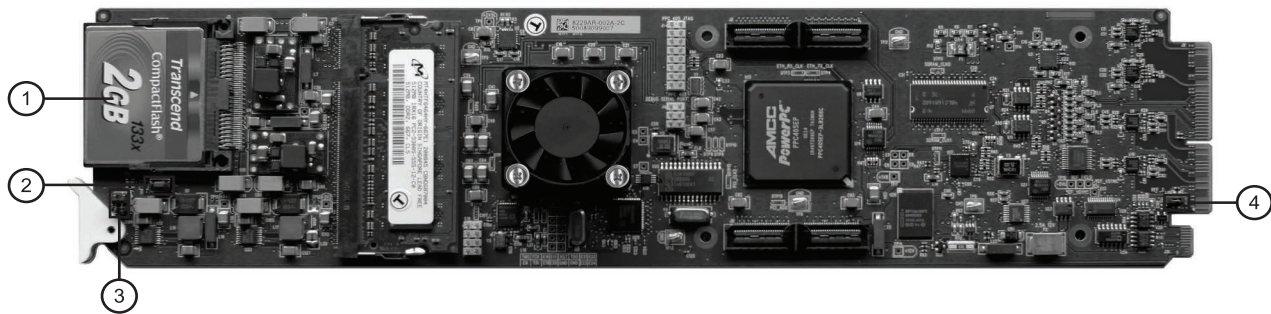
Figure 2 Components — MDK-111A-M

1) CompactFlash® Card	2) JP5, JP6
3) 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-M.

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 3**).
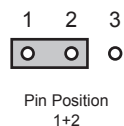
Figure 3 J7 — Default Position

› **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 4** outlines the locations of the card-edge controls.
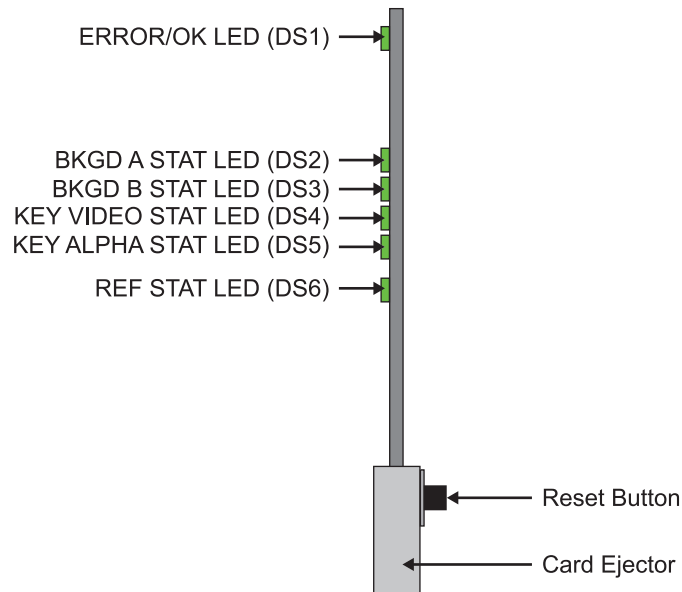
Figure 4 Card-edge Controls

Table 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.
KEY VIDEO STAT	Green	When this LED is green, the EXT KEY video input is valid.
	Red	When this LED is red, the EXT KEY video input is not present or is invalid.
KEY ALPHA STAT	Green	When this LED is green, the EXT ALPHA video input is valid.
	Red	When this LED is red, the EXT ALPHA video 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.

Supported Rear Modules

The **8320AR-033** rear module is required. Each rear module occupies four slots in the openGear frame. The 8320AR-033 rear module provides four video inputs and four programmable video outputs.
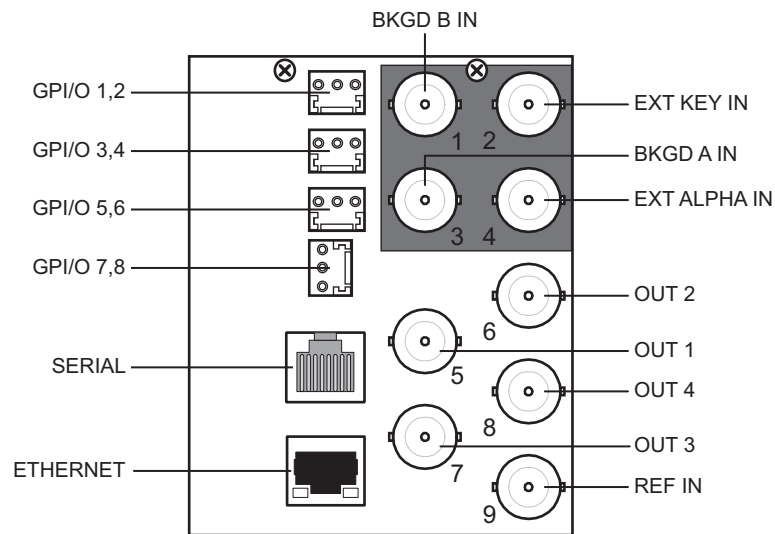
Figure 5 Cabling Designations — 8320AR-033 Rear Module

Physical Installation

This chapter provides a brief overview of the physical installation of the MDK-111A-M.

⚠ **Caution** — *If possible, do not block the ventilation holes on the top of the openGear frame that houses the MDK-111A-M. A 1RU open space above the frame gives the maximum air cooling and allows the frame filled with MDK-111A-M 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.*

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.

Installing a Rear Module

The 8320AR-033 rear module occupies four slots in the openGear frame. It is recommended to use the following slot combinations:

- Slots 1, 2, 3, 4
- Slots 5, 6, 7, 8
- Slots 9, 10, 11, 12
- Slots 13, 14, 15, 16
- Slots 17, 18, 19, 20

✸ If the rear module is already installed in your openGear frame, skip this section.

To install a rear module in an openGear frame

1. Ensure that the frame is properly installed according to instructions.
2. Remove the Blank Plates from the rear of the selected card frame slots.

✸ 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.
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.

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

✸ Do not over tighten.

6. Ensure proper frame cooling and ventilation by having all rear frame slots covered with rear modules or Blank Plates.

Installing a Card

The slot that the MDK-111A-M installs into depends on the slot combination you installed the rear module in. This allows adequate spacing to avoid damaging the card, the cards installed in the neighboring slots, or both.

Refer to **Table 2** for valid slot combinations.

Table 2 Card Slot Combinations

Rear Module is Installed in	PCB Installs into Slot
Slots 1, 2, 3, 4	2
Slots 5, 6, 7, 8	6
Slots 9, 10, 11, 12	10
Slots 13, 14, 15, 16	14
Slots 17, 18, 19, 20	18

To install the card in an openGear frame

1. Ensure that the 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

This chapter summarizes the cabling for the 8320AR-033 rear module, and how to connect the video and references sources for your MDK-111A-M.

For More Information on...

• the cabling designations for the rear module, refer to "**Supported Rear Modules**".

Power Fail Relay

The 8320AR-033 rear module includes a power fail relay from **BKGD A IN** to **OUT 1** 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 the **BKGD A IN** to **OUT 1** 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.

SDI Cabling

 This section provides general instructions for video input and output cabling the rear module. You can use up to 80m of industry standard 75ohm coaxial cable.

The 8320AR-033 rear module provides four video inputs and four programmable video outputs.
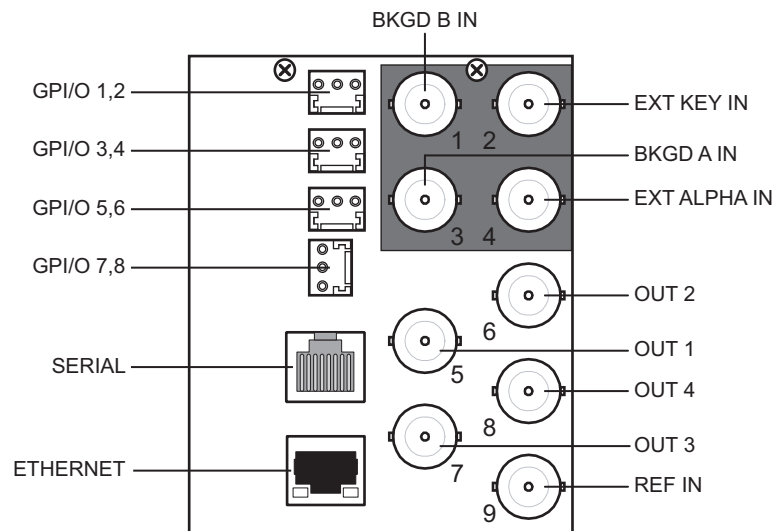
Figure 6 Cabling Designations — 8320AR-033 Rear Module

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.

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 7**).
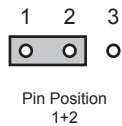
Figure 7 J7 — Default Position

   • **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 "**Selecting the Reference Source**".

Serial Port Cabling

The MDK-111A-M includes 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 3** includes serial cable pinout details. Ross Video does not supply this cable.

To set up serial communications for the card

1. Refer to **Table 3** 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 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 "**Serial Communication Setup**".

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 3** shows the pin assignment of the **Serial** port located on the rear module.

Table 3 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.

✶ 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 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 "**Ethernet Communication Setup**".

GPI/Tally Cabling

The MDK-111A-M 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. 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 set up for contact closure to ground, with 4.75Kohm pull-up resistor to +5V, so they default to a logical high state.

✱ 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 6** for port 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 8** for GPI/Tally configuration on the rear modules.
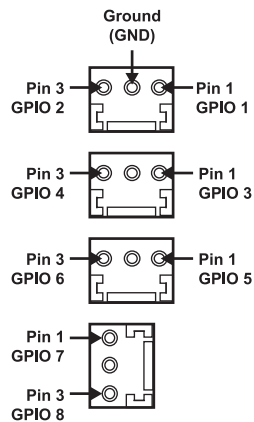
Figure 8 GPI Connections — 8320AR-033

For More Information on...

• configuring the GPI/Tally ports, refer to "**GPI/Tally Communication Setup**".

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-M.

LTC Cable Connections

There are two methods of cabling an LTC input to the MDK-111A-M: 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...

- configuring your card to communicate with an LTC device, refer to "**LTC Communication Setup**".

To cable the serial port for an LTC input

1. Refer to **Table 4**, and your LTC device documentation, for pinout information for your required **Serial Interface Cable**.

Table 4 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 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 "**LTC Communication Setup**".

To cable a GPI port for an LTC input

> ![notice icon] **Notice** — *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. Refer to the rear module labeling, and **Figure 6** for locations.

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 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 2-38 to configure the card to communicate with the LTC device.

Getting Started

This chapter provides instructions for launching DashBoard, and accessing the MDK-111A-M interfaces in DashBoard.

If you have questions pertaining to the operation of MDK-111A-M, contact us at the numbers listed in "**Contacting Technical Support**". Our technical staff is always available for consultation, training, or service.

For More Information on...

• installing and using DashBoard, refer to the *DashBoard User Manual*.

Before You Begin

Ensure that:

• The openGear frame that houses the MDK-111A-M displays in the Basic Tree View of DashBoard.
• The MDK-111A-M displays as a sub-node in the openGear frame tree.

Launching DashBoard

DashBoard must run on a computer that has a physical wired Ethernet connection. Wireless connections do not allow device discovery.

✷ 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.

To launch DashBoard

1. Ensure that the DashBoard client software is installed on a PC connected to your facility network.

2. Launch DashBoard by double-clicking its icon on your desktop.

3. Ensure that the openGear frame with the MDK-111A-M is displayed in the Tree View located on the left-side of the DashBoard window. If not, consult the *DashBoard User Manual*.

Accessing the MDK-111A-M Interfaces in DashBoard

DashBoard displays the MDK-111A-M interfaces for configuring, monitoring, and operating your card.

To access a card in DashBoard

1. 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-M.

2. Double-click the node for a card to display its menus in the **Device View** of DashBoard (right-side of the DashBoard window).
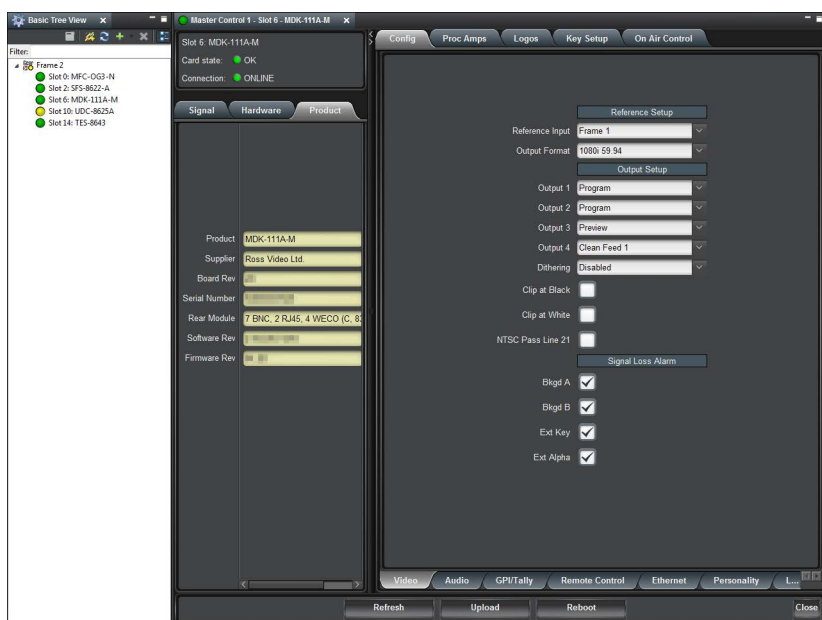
Configuration

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

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 of the card. The settings can be specified manually (**Static**) or may be obtained automatically from a server on your network (**DHCP**).

✷ 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**" 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.
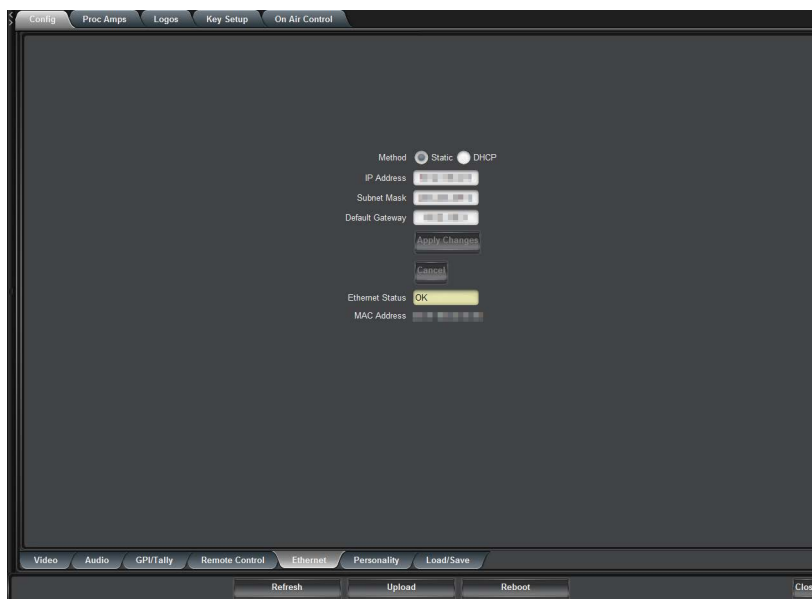
3. To obtain network settings automatically, select **DHCP**.

4. To manually configure the ethernet settings:

   a. Select **Static**.

   b. Enter the **IP Address**, **Subnet Mask**, and **Default Gateway** settings for the card.

5. Click **Apply Changes** to save the new settings.

✷ Clicking **Cancel** will revert to the previous settings.

Selecting the Reference Source

The openGear frame supports the distributed frame reference, allowing incoming reference signals to feed timing information to all cards in a 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 "**Cabling a Reference Source**".

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 5**.

Table 5 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.

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.

3. Select a reference source from the **Reference Setup** area. Refer to **Table 11** for a list of options.

Configuring the Video Inputs and Outputs

This section outlines how to specify the format for all the card outputs. The output must be compatible with the selected reference.

✸ The EXT KEY, and EXT ALPHA sources must be the same format as the output format.

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 the same video format as specified in the **Config** tab for the card. If the formats do not match, the card reports an error in the DashBoard **Signal Status** area and on the card-edge LEDs.
- The Program and Preview sources can be any of the four internally generated Logo channels or external inputs, or an internally generated black.
- Each output can be configured as Program, Preview, or one of four Clean Feeds.
- 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.

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.
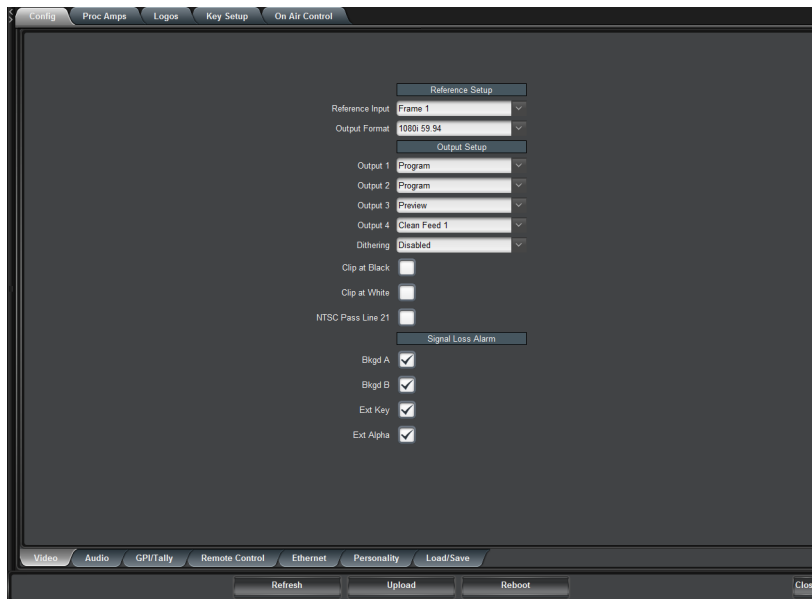
3. Select the card output video format from the **Output Format** menu. Ensure that it is the same format as in the input video format.

✶ Use the **Signal** tab to monitor the Signal status, including the reference and the Background sources. Refer to "**Status Tabs**" for more information.

4. From the **Output Setup** area, locate the Output BNC you want to configure.
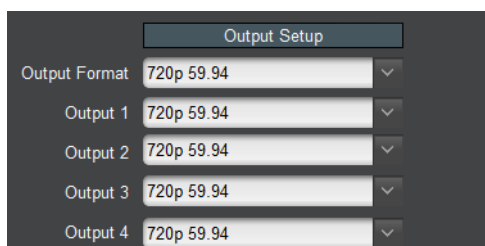
5. Choose an output to configure as follows:
   - **Output 1** — Select this field to configure the source on OUT 1.
   - **Output 2** — Select this field to configure the source on OUT 2.
   - **Output 3** — Select this field to configure the source on OUT 3.
   - **Output 4** — Select this field to configure the source on OUT 4.

6. Select the output that you want to assign to the selected OUT BNC from the **Output** field. You can choose between the following:
   * **Program** — Select this option to assign the source to the Program output.
   * **Preview** — Select this option to assign the source to the Preview output.
   * **Clean Feed** — Select this option to assign the source to one of the Clean Feeds.

7. From the **Dithering** field, select the type of dithering you want to apply to all outputs. Refer to **Table 11** for a list of options.

8. Enable the Clip White or Clip Black feature. Refer to **Table 11** for a list of options.

9. Enable the **NTSC Pass Line 21** when using NTSC (480i) video format as outlined in **Table 11**.

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, external Key, or external Alpha 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 "**Card-edge LEDs**".

To set up the Signal Loss Alarm feature

1. From the **Device View**, select the **Config** tab.

2. Select the **Video** tab located at the bottom of the **Config** tab.

3. 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 on the rear module.
   * **Bkgd B** — Select this box to enable DashBoard to report the status of the BKGD B input source on the rear module.
   * **Ext Key** — Select this box to enable DashBoard to report the status of the EXT KEY video input source on the rear module.
   * **Ext Alpha** — Selecting this box enables DashBoard to report the status of the EXT ALPHA input source on the rear module.

For More Information on...

* messages displayed in the **Timing** fields, refer to "**Signal Tab**".

Audio Mixing Configuration

The Audio Mixing feature in the **Config** tab for the MDK-111A-M configures how audio mixing, including Fade to Black, is performed.

To configure the Audio Mixing feature

1. From the **Device View** tab, select the **Config** tab.

2. Select the **Audio** tab located at the bottom of the **Config** tab.
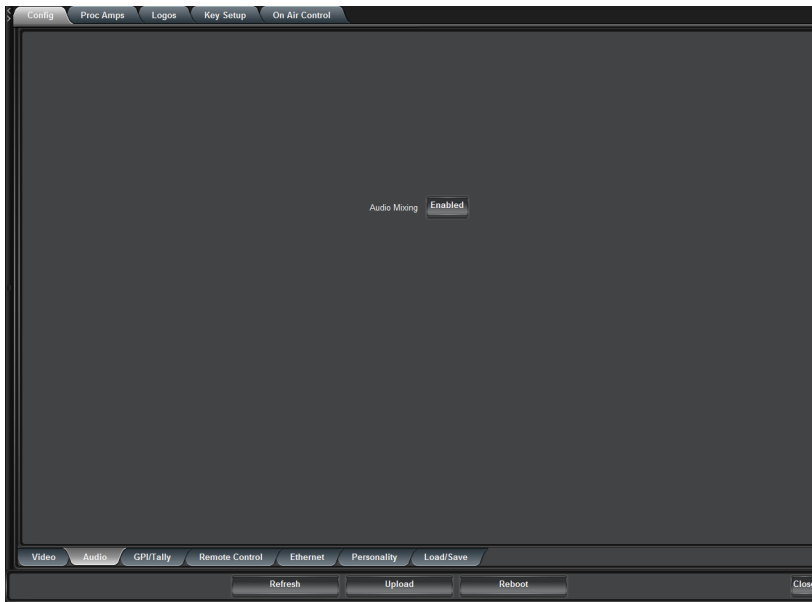
3. Configure the Audio Mixing feature as outlined in **Table 12**.

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 serial communications using DashBoard.

✶ 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 "**Serial Port Cabling**".
• cabling the **Ethernet** port, refer to "**Ethernet Port Cabling**".

Serial Communications via the Serial Port

This procedure outlines how to establish communications with a device when it is connected to the **Serial** port on the MDK-111A-M 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.
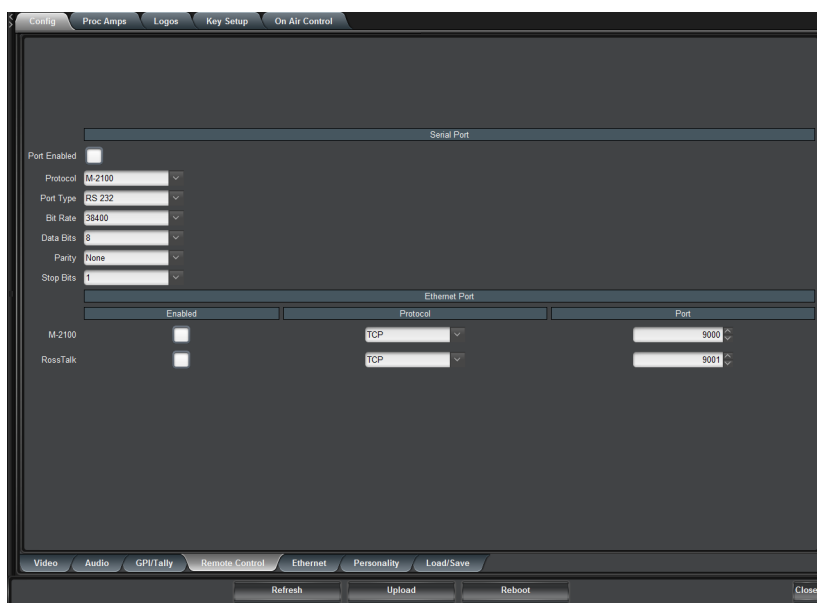
3. Select the serial communication protocol for the external device connected to the Serial Com port from the **Protocol** menu. Refer to **Table 15** for a list of options.

✶ 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 15** 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.

✶ These settings have no effect when **Protocol** is set to **Timecode**.

6. Select the **Port Enabled** 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

Use the following procedure to configure the card to communicate via an ethernet connection:

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:

    a. Select the **M-2100 Enabled** 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.

    b. From the **Protocol** menu, select a Transport Layer Protocol. Refer to **Table 15** for a list of options.

    c. From the **Port** menu, specify the Port Address for your serial device. Choose a unique port number between 1 and 32767.

✶ 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.

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, a 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 defaults 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.
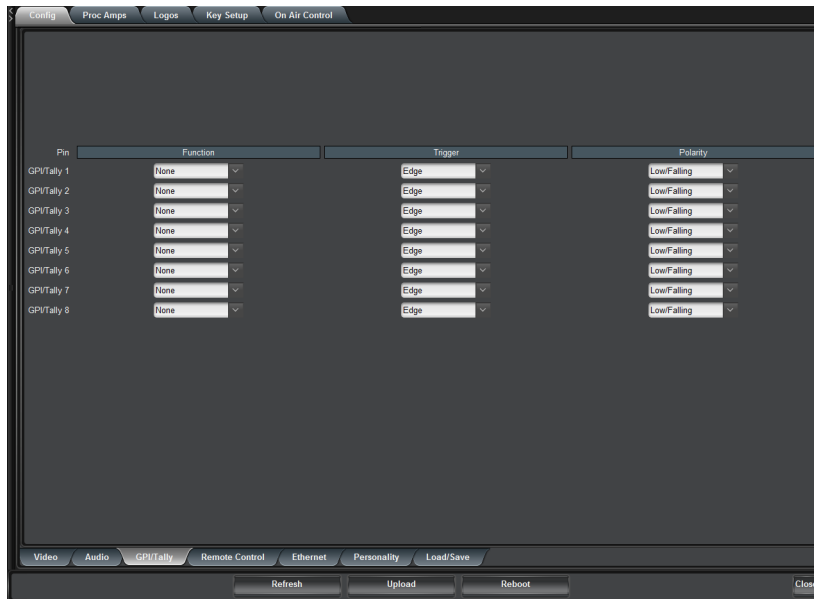
3. Assign a transition event to a GPI by selecting the function next to the GPI in the **GPI/Tally** area. Refer to **Table 13** for a list of options.

4. Select a trigger for the GPI from the **Trigger** column. Refer to **Table 13** for a list of options.

5. Select a Polarity for the GPI from the **Polarity** column. Refer to **Table 13** 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 13** for a list of options.

4. Select the polarity of the tally from the **Polarity** column. Refer to **Table 13** 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.
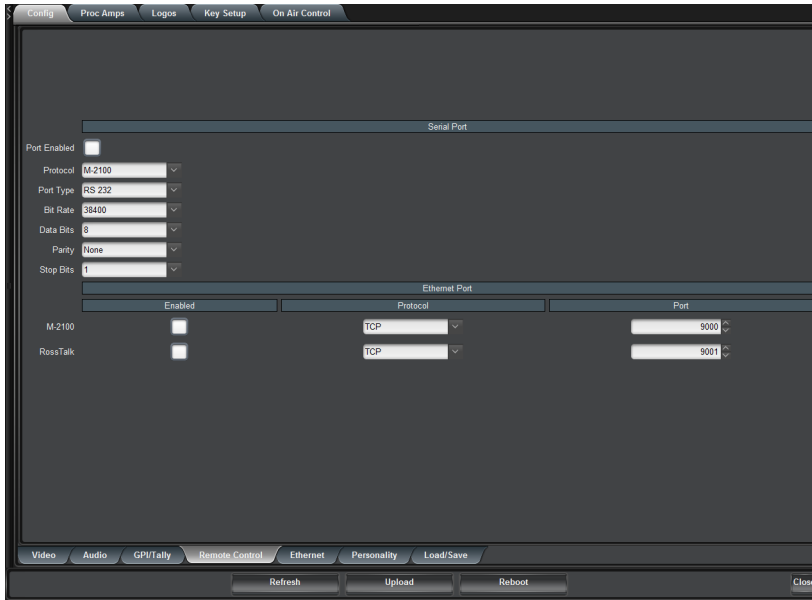
2. Locate the **Serial Port** area.
3. Select **RS 422 unterm** from the **Port Type** menu.
4. Select **Timecode** from the **Protocol** menu.
5. Select the **Port Enabled** box.

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.

✶ 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.
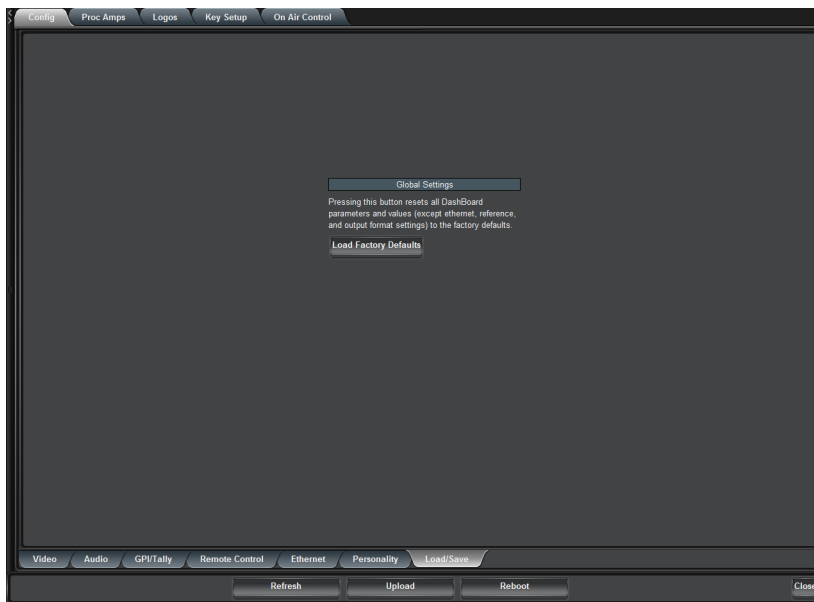
3. From the **Global Settings** area, click **Load Factory Defaults** to display the **Confirm** dialog.

4. Click **Yes** to load the factory default values for all menu parameters.

✱ Clicking **No** will cancel the load and close the dialog.

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.

✱ 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.
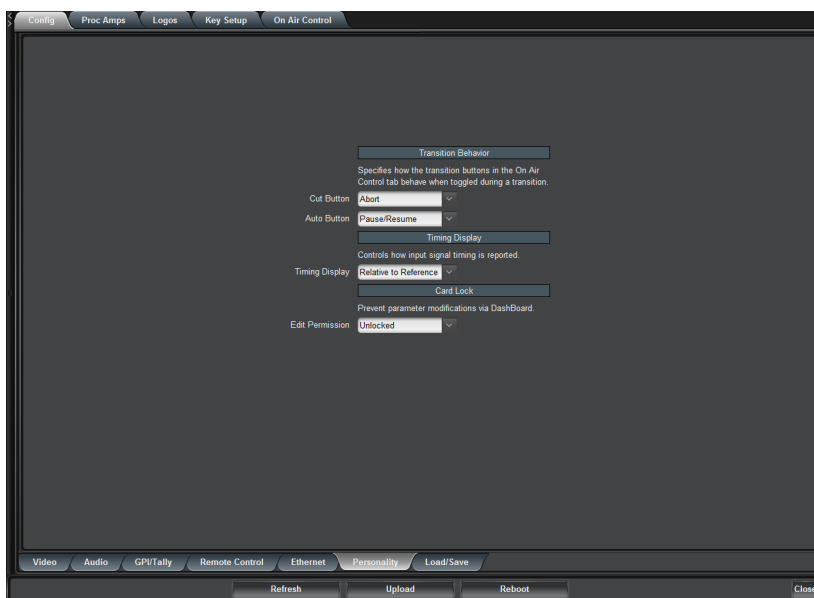
3. Configure the **Cut** button behavior by choosing an option from the **Cut Button** menu. Refer to **Table 17** for a list of options.

4. Configure the **Auto** button behavior by choosing an option from the **Auto Button** menu. Refer to **Table 17** 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 17** 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 **Bkgd A, Bkgd B, Ext Key**, and **Ext Alpha 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 17** for a list of options.

Operation

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

✱ 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

4. Select an output signal to adjust as follows:

   a. Select the **Proc Amps** tab.

   b. 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.
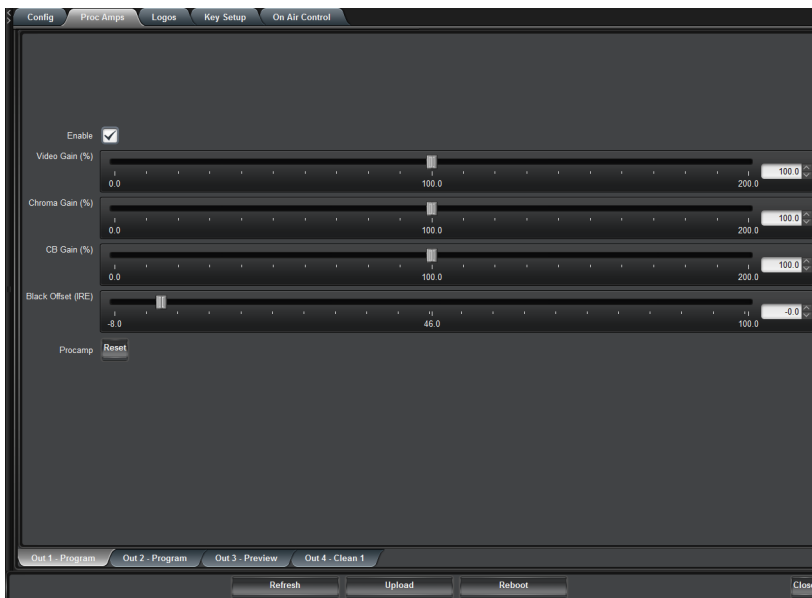
5. Select the **Enable** box to ensure the color adjustments are applied.

✱ The **Enable** box must be selected in order for any color correction to take effect on the selected output.

6. 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.

7. User 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.

8. 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.

9. 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

You can set the Key Type to:

• **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.
• **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.

To configure a key

1. From the **Device View**, select the **Key Setup** tab.
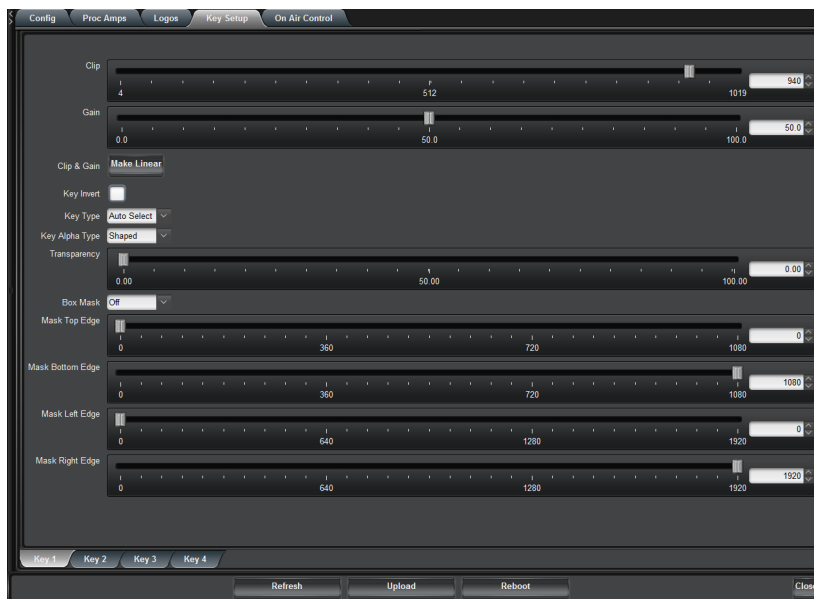
2. From the **Key Setup** tab, select the tab for the key you wish to configure.

3. If the **Key Type** is set to **Auto Select**:

    •   Select this option to use the EXT VIDEO source on the rear module as the Key Video and the EXT ALPHA source as the Key Alpha when **Key Video** is used for the key source.

    •   The **Key Alpha Type** is automatically set to **Shaped**.

4. If the **Key Type** is set to **Self**:

    •   Select this option to use the EXT VIDEO source on the rear module as the Key Video, when **Key Video** is selected for the key source on the **On Air** tab, and its own luminance value of the same video as the Key Alpha.

    •   The **Key Alpha Type** is automatically set to **Unshaped**.

5. If required, select the **Key Alpha Type** from the **Key Alpha Type** menu. Refer to **Table 21** for a list of options.

6. Adjust the **Clip** and **Gain** values of the key as needed. Refer to **Table 21** for a list of options.

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

7. Adjust the **Transparency** level of the key as outlined in **Table 21**.

8. 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 **Key Type** menu. Refer to **Table 21** for a list of options.

3. Adjust the position of the mask using the Mask Edge sliders as outlined in **Table 21**.

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 "**Configuring a Key**".

2. Select the **On Air Control** tab to display the menu options.
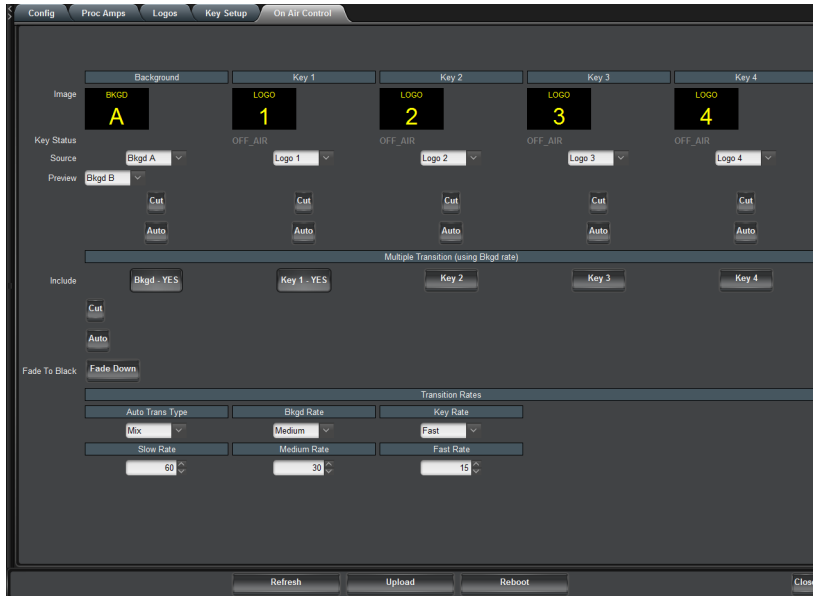
3. Select the **Program** output for the Background from the **Source** menu. This selects what is on the Program bus background. Choose from the following:
   - **Black** — Sets the source for the Background Program output to Black.
   - **Bkgd A** — Select this option to assign the BKGD A input source as the Background Program output.
   - **Bkgd B** — Select this option to assign the BKGD B input source as the Background Program output.
   - **Ext Key** — Select this option to assign the EXT KEY input source as the Background Program output.
   - **Ext Alpha** — Select this option to assign the EXT ALPHA 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. Choose from the following:

  • **Black** — Sets the source for the Background Preview output to Black.
  • **Bkgd A** — Select this option to assign the BKGD A input source on the rear module as the Background Preview output.
  • **Bkgd B** — Select this option to assign the BKGD B input source on the rear module as the Background Preview output.
  • **Ext Key** — Select this option to assign the EXT KEY input source on the rear module as the Background Preview output.
  • **Ext Alpha** — Select this option to assign the EXT ALPHA input source on the rear module as the Background Preview output.
  • **Logo #** — Select this option to assign the specified Logo channel as the Background Preview output.
  • **Alpha #** — Select this option to assign the specified Alpha channel as the Background Preview output.

5. Repeat step 3. For each key, select the source for the key. Key layering is fixed, and starts with Key 1 and progresses to Key 4.

6. If you are performing a transition with multiple keys, toggle the required **Include** button(s) in the **Multiple Transition** area.

7. Select an **Auto Trans Type** from the **Transition Rates** area as follows:

  • **Mix** — Select this option to perform a gradual fade from one source to the next. The MDK-111A-M performs a cross fade between sources.
  • **Fade-Fade** — Select this option to perform a double transition from the Program source to Black to the Preview source. The MDK-111A-M fades down from one source to black and then transitions to the next source.
  • **Take-Fade** — Select this option to perform a cut to black, then fade up to the next source.
  • **Fade-Take** — Select this option to fade from one source to black and then cut to the next source.

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 "**Configuring a Key**".

2. Set up your transition options as outlined in "**Transitions Setup**".

3. In the **Device View**, select the **On Air Control** tab.

4. Set the **Background Transition Rate** as follows:

  a. From the **BKGD Rate** menu, select a transition rate to set up.

  b. Specify the rate, in number of frames, as required, in the **Slow Rate**, **Medium Rate** and **Fast Rate** fields.

5. Set the **Key Transition Rate** as follows:

  a. From the **Key Rate** menu, select a transition rate to set up.

  b. 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:

a. From the **Key Rate** menu, select a transition rate to set up.

b. Specify the rate, in number of frames, as required, in the **Slow Rate**, **Medium Rate** and **Fast Rate** fields.

Performing a Cut Transition

✦ 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 "**Configuring the Transition Buttons**" for details.

To perform a Cut transition on the card

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 "**Configuring the Transition Buttons**".

3. To perform a Cut transition between Background sources:

   a. Select a source for the Program output from the Background **Source** menu.

   b. Select a source for the Preview output from the **Preview** menu.

   c. Click **Cut** located below the **Background** thumbnail.

   d. Notice that the selections for the Program and Preview menus swap in anticipation of the next transition.

4. To perform a Cut transition for a Key:

   a. Select a source for the Program output from the desired Key **Source** menu.

   b. 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.

5. To perform a Cut transition between multiple sources:

   a. Select the sources for the Program output using the options in the **Source** menus for each Key.

   b. From the **Multiple Transition** area, select the **Include** button(s) for any Key or Background sources to be included in the transition.

   c. Click **Cut** in the **Multiple Transition** area.

   The **Key Status** fields indicate the on-air status of each key included in the transition.

✦ 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.

✦ 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 "**Configuring the Transition Buttons**" 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 "**Configuring the Transition Buttons**".

3. Ensure the **Auto Trans Type** is set to the desired type in the **Transition Rate** area.

   • If the **Auto Trans Type** is set to **Mix,** the transition performs a fade directly between Background sources.
   • If the **Auto Trans Type** is set to **Fade-Fade**, it fades to black then to the next Background source.
   • If the **Auto Trans Type** is set to **Take-Fade**, it cuts to black, then fades up to the next Background source.
   • If the **Auto Trans Type** is set to **Fade-Take**, it fades from one Background source to black and then cuts to the next Background source.

4. If you want to select a different transition rate, set it now. Refer to "**Transition Rates**" for details.

5. To perform an Auto Background transition:

   a. Ensure the Background sources are configured.

   b. Click **Auto** located below the **Background** thumbnail.

   The selections for the Program and Preview menus swap in anticipation of the next transition.

6. To perform an Auto Key transition:

   a. Select the sources to be included in the transition.

   b. 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.

7. To perform a multiple Auto Background and an Auto Key transition simultaneously:

   a. Select the sources to be included in the transition.

   b. Select the **Include** button(s), located in the **Multiple Transition** area, for any Keys or Backgrounds to be included in the transition.

   c. Click **Auto** in the **Multiple Transition** area.

Performing a Fade to Black

The **Fade to Black** feature allows you to fade to black, where the Program bus is faded to black at the Background Rate.

✳ If the **Fade Down/Fade Up** button is toggled while a Fade to Black is in transition, the Fade will reverse.

To perform a Fade to Black

1. From the **Device View**, select the **On Air Control** tab.

2. To perform a Fade to Black, toggle the **Fade to Black** button as follows:

   • **Fade Down** — When the button displays this label, clicking it performs an Auto transition to black. The button label changes to **Fade Up**.
   • **Fade Up** — When the button displays this label, clicking it performs an Auto transition from black. The button label changes to **Fade Down**.

Media File Management

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

Overview

This section provides a general overview of the media file management features of the MDK-111A-M.

DashBoard enables you to select and configure the four Logo channels that are loaded in the MDK-111A-M. 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-M using FTP protocol. The media files are stored on a CompactFlash® card that is installed on the MDK-111A-M.
* 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 "**Loading Media Files**".
* adjusting the position of a still image, refer to "**Adjusting On-Air Properties**".
* image specifications and renaming media files, refer to "**Managing Media Files**".
* managing media files using an FTP client, refer to "**Connection using FTP**".
* using the CompactFlash® card, refer to "**CompactFlash® Card**".
* using timecode, refer to "**Configuring a Logo Channel to Display LTC**".

Loading Media Files

The MDK-111A-M features four Logo channels (Logos 1-4) into which you can load files from the CompactFlash® Card physically installed on the MDK-111A-M. Each card has 2GB of DDR playout memory. **Table 6** lists an estimation of how many uncompressed frames can fit into the playout memory of the MDK-111A-M.

Table 6 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

✷ 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 "**Configuring a Logo Channel to Display LTC**" 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 "**Managing Media Files**" for details.
- **User created directories** — A list of user-created directories using an FTP connection.

To load a media file into a Logo channel

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

✦ You can clear space in the image cache by selecting **None** from the **Filename** menu of any Logo channel. This 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. T he 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.
- **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 20**.

To adjust the on-air properties of a media file

1. Load a media file as outlined in "**Loading a Media File**".
2. Adjust the position of a still image in the viewing area of the screen using the **X** and **Y Position** sliders.

✱ 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.

✱ 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.

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.

✱ 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 "**Loading a Media File**".

Image Specifications

Media files used on the MDK-111A-M must meet the specifications outlined in **Table 7**. Note that if larger images are used, the images will be clipped to the dimensions listed in **Table 7**.

Table 7 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-M 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-M. You can also use an FTP client to delete images on the CompactFlash® Card and re-name images.

To access the MDK-111A-M via FTP

1. Have the IP address from Config-Ethernet.
2. Ensure an ethernet cable is plugged into the MDK-111A-M rear module. Refer to "**Ethernet Port Cabling**" for connection details.

An FTP connection to the MDK-111A-M 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-M 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 7**. Note that the transfer of animations is not supported at this time. 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-M. Refer to the XPression documentation for details.

To connect to the XPression via RossLinq, establish an FTP connection using the following information:

- 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 documentation.

CompactFlash® Card

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

* the CompactFlash® Card must be installed on the MDK-111A-M before the MDK-111A-M powers up and must remain inserted.
* if you wish to remove the CompactFlash® Card for programming, you must re-boot the MDK-111A-M when you re-install the CompactFlash® Card. This allows the MDK-111A-M 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-M, refer to "**Linear Timecode Cabling**".
* setting up communications between an LTC device and the MDK-111A-M, refer to "**LTC Communication Setup**".

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.

✷ When using a progressive video format, the LTC standard only provides a count of every second frame, but the MDK-111A-M 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:

   a. Select the **Logos** tab in the **Device View**.

   b. Select the tab for the Logo channel you want to load the timecode file for.
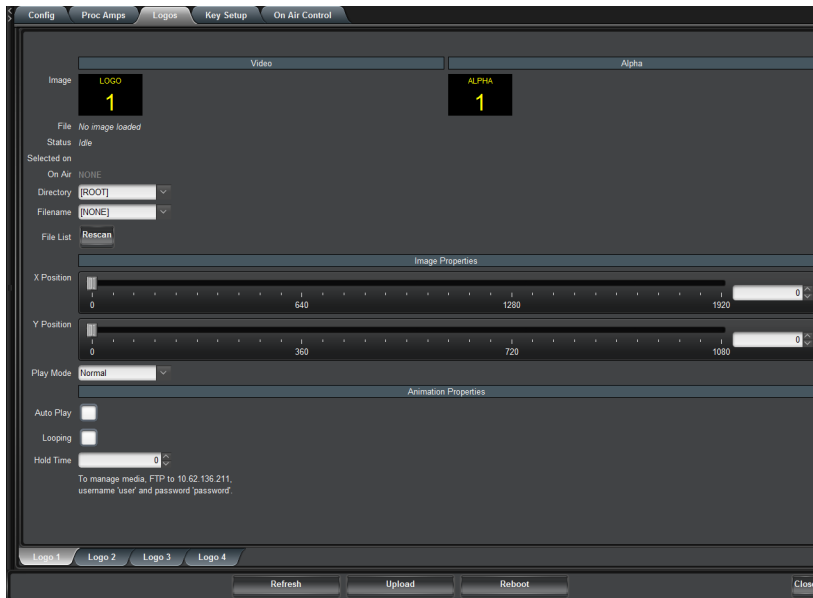
2. Select a timecode file to load to the Logo channel as follows:

   a. From the **Directory** menu, select **[PATTERNS]**.

   b. 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 "**Configuring a Key**".

✱ 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:

   a. Click the **On Air Control** tab to display the menu options in the **Device View**.

   b. Locate the output you wish to assign the Logo channel to.

   c. From the associated **Source** menu, 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.

* 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 transition between the keys, or the Background when using an MDK-111A-M. This can be used to transition the LTC on and off air. Refer to "**Performing Transitions**" for an overview of transitions.

Upgrading the Software

The card can be upgraded in the field using the **Ethernet** port on the rear module and using the options available in DashBoard. This procedure assumes that you are running DashBoard v3.0.0 or higher.

For More Information on…

* setting up ethernet communications, refer to "**Ethernet Communication Setup**".

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 "**Ethernet Port Cabling**" 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 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 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.

✶ 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 16** 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.

DashBoard Menus

This chapter briefly summarizes the menus, items, and parameters available from the DashBoard Control System for the MDK-111A-M. Default values are noted with an asterisk (*). Some menu and options are card dependent.

✶ 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 8 summarizes the read-only information displayed in the **Signal** tab.

Table 8 Signal Tab Items

Item	Parameters	Description
Reference Status	OK (Green)	Valid reference signal
	No reference (Red)	No signal detected on selected reference input
	Reference Unlocked (Red)	Signal detected, but not locked (or lock lost)
	Invalid Reference (Red)	Signal detected, but incompatible with the current video mode
Reference Format	Unknown	No signal present, or format is not recognized
	#	Indicates the reference format detected
Bkgd A 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
Bkgd B Status	Same parameters as above but for the BKGD B signal on the rear module	
Ext Key Status	Same parameters as above but for the EXT KEY signal on the rear module	
Ext Alpha Status	Same parameters as above but for the EXT ALPHA signal on the rear module	

Table 8 Signal Tab Items

Item	Parameters	Description
Bypass Relay	Normal (not in bypass) (Green)	Video is being routed through the card; keyers may be active
	Active (in bypass) (Red)	BKGD A bypasses the card and is looped passively on OUT 1 through the relay.
Timing Display	Relative to Reference	The Timing fields display the input signal timing values relative to the selected analog reference
	Input to Output	The Timing fields display the input signal timing values relative to the SDI output of the card
Bkgd A Timing	## Clocks ## lines	Indicates the timing of the BKGD A input signal relative as specified in the Timing Display feature. Where 1 clock is 1 period of 27MHz (SD) or 1 period of 148.xMHz (HD)
	Green	The BKGD A input signal is within the valid range
	Yellow	The BKGD A input signal is outside the valid range; a vertical shift will occur[a]
	Grey	The BKGD A input signal is not available
Bkgd B Timing	Same parameters as above but for the BKGD B	
Ext Key Timing	Same parameters as above but for the EXT KEY signal	
Ext Alpha Timing	Same parameters as above but for the EXT Alpha signal	
Output Timing	## Clocks ## lines	Indicates the timing of the output signals relative to the reference
Bkgd A Audio	1**s** 2**x** 3**a** 4s	Displays the audio status for each of the four audio groups where: • **s** indicates the presence of synchronous audio on the group • **x** indicates that audio is not present • **a** indicates the presence of asynchronous audio on the group
Bkgd B Audio	Same parameters as above but for the BKGD B signal	

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

Table 9 Hardware Tab Items

Item	Parameters	Description
Voltage (V)	#	Supply Voltage, in Volts
Current (mA)	#	Current consumption of card in milliAmperes

<p align="center">*Table 9 Hardware Tab Items*</p>

Item	Parameters	Description
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: • **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: • CompactFlash card is not present • An error has occurred such as incompatible CompactFlash card is installed, or an error in reading the card
Playout RAM	a/b/c/d	Displays RAM memory usage where: • **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 10 summarizes the read-only information displayed in the **Product** tab.

<p align="center">*Table 10 Product Tab Items*</p>

Item	Parameters	Description
Product	MDK-111A-M	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 Tabs

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

Video Tab

Table 11 summarizes the **Video** tab options available in DashBoard.

Table 11 Video Tab Options

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
	Local	Select this option to use the external reference source connected to BNC 9 on the rear module. Use J7 on the card to enable or disable a 75ohm terminator on the External Reference input. Refer to "**Card Overview**" 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	
	1080i 50	
	1080PsF 24	
	1080PsF 23.98	
Output Setup		
Output #ᵃ	Program*	The specified output displays the program output
	Preview	The specified output displays the preview output
	Clean Feed #	The specified output displays the selected clean feed output
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
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

Table 11 Video Tab Options

Item	Parameters	Description
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 A	Selected*	An alarm is triggered when a missing or an invalid signal is detected on the BKGD A input
	Cleared	The alarm is suppressed when a missing or an invalid signal is detected on the BKGD A input
Bkgd B	Same parameters as above but for the BKGD B signal	
Ext Key	Same parameters as above but for the EXT KEY signal	
Ext Alpha	Same parameters as above but for the EXT ALPHA signal	

a. The default for Output 1 and Output 2 is Program, the default for Output 3 is Preview, and the default for Output 4 is Clean Feed.

Audio Tab

Table 12 summarizes the **Audio** tab options available in DashBoard.

Table 12 Audio Options

Item	Parameters	Description
Audio Mixing	Enabled*	Audio follows video; use for normal PCM audio
	Disabled	Audio is hard-cut during transition; use for non-PCM audio such as Dolby®

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-M.

Table 13 GPI Setup Menu Items

Item	Parameter	Description
GPI #		
Function	GPI Cut Bkgd	A cut is performed between the Background sources when this GPI input is triggered.
	GPI Auto Bkgd	An auto transition is performed between the Background sources when a trigger is received by that GPI input.
	GPI Cut Key #	A cut transition is performed on the specified Key when a trigger is received by that GPI input

Table 13 GPI Setup Menu Items

Item	Parameter	Description
Function	GPI Auto Key #	An auto transition is performed to bring the key on-air or off-air when this GPI input is triggered
	GPI Fade to Black	A fade to black is performed when a trigger is received by that GPI input.
	None*	The GPIO port is not configured and the GPI has no effect (default). The Trigger and Polarity settings are ignored.
	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.
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 14 Tally Setup Menu Items

Item	Parameter	Description
Tally #		
Function	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.

<div align="center">Table 14 Tally Setup Menu Items</div>

Item	Parameter	Description
Function	Tally Bkgd B	Configures the GPI/O port as an output and reflects the on-air status of BKGD B.
	Tally Ext Key	Configures the GPI/O port as an output and reflects the on-air status of EXT KEY.
	Tally Ext Alpha	Configures the GPI/O port as an output and reflects the on-air status of EXT ALPHA.
	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.
	None*	The GPI/O port is not configured and the tally has no effect. The Polarity setting is ignored.
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

The **Remote Control** tab enables you to set up serial communications between the MDK-111A-M, and a device connected to the **Serial** port on the rear module or via a network connection. Note that the default values for the Port Type, Bit Rate, Data Bits, Parity, and Stop Bits values change depending on the Protocol selected.

✴ 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)

<div align="center">Table 15 Remote Control Tab Items</div>

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 to communicate with the card.
	Timecode	Select this option if you are communicating with an LTC device. Refer to "**LTC Communication Setup**" for details.

Table 15 Remote Control Tab Items

Item	Parameter	Description
Protocol	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 our website.
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.
	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. This mode is used to daisy-chain several card Rx ports, where only the last one would be terminated.
Bit Rate	9600	Selects the bit rate for the external device connected to the Serial COM port
	19200	
	38400	
	57600	
	115200	
Data Bits	7	Sets the number of data bits transmission (character length)
	8	

Table 15 Remote Control Tab Items

Item	Parameter	Description
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 • 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 16 Ethernet Tab Items

Item	Parameter	Description
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	

Table 16 Ethernet Tab Items

Item	Parameter	Description
Cancel		Cancels 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: • 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-M.

Table 17 Personality Tab Items

Item	Parameter	Description
Transition Behavior		
Cut Button	Abort*	Returns the transition to the beginning when the Cut button is pressed again while a transition is in progress
	Finish	Instantly finishes the transition when the Cut button is toggled
	Ignore	Disregards any successive presses of the Cut button until the transition is complete
Auto Button	Pause/Resume*	Pauses the transition when the Auto button is toggled, and resume the transition when the button is pressed again
	Reverse	Reverses the transition back to the start
	Ignore	Disregards any successive presses of the Auto button until the transition is complete
Timing Display		

Item	Parameter	Description
Timing Display	Relative to Reference*	The BKGD Timing, Ext Key Timing, and the Ext Alpha Timing fields in the Signal tab displays the timing values relative to the reference. • A negative offset value indicates that the SDI signal is earlier than the analog reference. • A positive value indicates that the SDI signal is later than the analog reference.
	Input to Output	The BKGD Timing, Ext Key Timing, and the Ext Alpha Timing fields in the Signal tab displays the timing values relative to the output. • A negative offset value indicates that the SDI input signal is earlier than the SDI OUT signal. • A positive value indicates that the SDI input signal is later than the SDI OUT signal.
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 18 Load/Save Tab Items

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 19 summarizes the **Proc Amps** tab options available in DashBoard. Each sub-tab is an output that can be configured.

Table 19 Proc Amps Options

Item	Parameters	Description
Out #		
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: • Increasing the gain increases the saturation of colors • Decreasing the gain de-saturates the colors until the signal is black and white
CB Gain (%)	0 to 200[c]	Adjusts the Cb component of the chrominance video signal: • 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: • 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 20 summarizes the **Logos** tab options available in DashBoard. Each sub-tab is a logo channel that can be modified.

Table 20 Logos Options

Item	Parameters	Description
Logo #		
Video Image	Displays a thumbnail image	• 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	• 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	• 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 Animation loaded (#) Single image loaded (#) Idle	• 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)
Selected on (read-only)	### None	Indicates all the key(s), or backgrounds, that currently have the media file selected
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] [ROOT] ###	• 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 • Displays the total memory usage of the RAM CACHE

Table 20 Logos Options

Item	Parameters	Description
Filename	xxx.yyy xxx_####.yyy	• Displays the name of the 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: • updates the Directory menu options • updates the Filename menu options
X Position	## to ##[a]	• 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]	• 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 value is 0.

Key Setup Tab

Table 21 summarizes the **Key Setup** tab options available in DashBoard. Each sub-tab is a key that can be modified.

Table 21 Key Setup Menu Items

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.

Table 21 Key Setup Menu Items

Item	Parameters	Description
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
Box Mask[d]	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 #[e]	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. This option is disabled when the SCTE-104 Triggers and Custom VANC Packets options are enabled in the Personality tab.
e. The range of values are dependent on the video format.

On Air Control Tab

Table 22 summarizes the **On Air Control** options available in DashBoard.

Table 22 On Air Control Options

Item	Parameters	Description
Background		
Image	Displays a thumbnail image	Displays a thumbnail image that represents the BKGD source
Source	Black	Assigns Black as the program output
	Bkgd #	Assigns the selected Background source as the program output
	Key Video	Assigns the external key source as the program output

Table 22 On Air Control Options

Item	Parameters	Description
Source	Key Alpha	Assigns the external alpha source as the program output
	Logo #	Assigns the selected Logo media file as the program output
	Alpha #	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
Preview	Black	Assigns Black as the preview output
	Bkgd #	Assigns the selected Background source as the preview output
	Key Video	Assigns the external key source as the preview output
	Key Alpha	Assigns the external alpha source as the preview output
	Logo #	Assigns the selected Logo media file as the preview output
	Alpha #	• 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
Key #		
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
Source	Black	Assigns Black as the Key output
	Bkgd #	Assigns the selected BKGD source as the Key output
	Ext Key	Assigns the external Key video source as the Key output
	Ext Alpha	Assigns the external Alpha source as the Key output
	Logo #	Assigns the selected Logo media file as the Key output

Table 22 On Air Control Options

Item	Parameters	Description
Source	Alpha #	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
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.
Multiple Transition (using Bkgd Rate)		
Include	Bkgd	Includes the BKGD source in the next transition
	Key #	Includes the specified Key source in the next transition
Cut	Cut	Performs a cut between the BKGD sources and the included Key sources simultaneously
Auto	Auto	Performs an auto transition between the BKGD sources and the included Key sources simultaneously
Fade To Black	Fade Down	The Program output fades to black (both the BKGD and the Key)
	Fade Up	The Program output fades from black back to its normal state; both the BKGD and Key are visible (if on-air)
Transition Rates		
Auto Trans Type	Mix*	A Video Cross Fade is performed for BKGD transitions and multiple transitions
	Fade-Fade	A Video V-Fade, through black, is performed for BKGD transitions and multiple transitions
	Take-Fade	A cut to black is performed then a fade up to the next BKGD source; this also applies to multiple transitions
	Fade-Take	The BKGD fades to black then performs a cut to the next BKGD source; this also applies to multiple transitions
Bkgd Rate	Slow	Sets the BKGD transition rate to Slow
	Medium*	Sets the BKGD transition rate to Medium
	Fast	Sets the BKGD transition rate to Fast
Key Rate	Same parameters as above[a]	
Slow Rate	1 to 999[b]	Defines the Slow Rate in frames

Table 22 On Air Control Options

Item	Parameters	Description
Medium Rate	1 to 999[c]	Defines the Medium Rate in frames
Fast Rate	1 to 999[d]	Defines the Fast Rate in frames

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

Serial Protocols

This chapter describes the communications protocol systems used with the MDK-111A-M.

GVG M-2100 Emulation Protocol

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

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

✱ 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, "**Serial Port Pin Assignment**" 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-M.

Table 23 GVG M-2100 Communication Settings

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

✱ The MDK-111A-M allows the GVG M-2100 protocol to be transported over TCP or UDP ethernet rather than by the serial port. Refer to "**Ethernet Port Cabling**" for cabling details.

Emulation Commands

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

Table 24 Supported GVG M-2100 Emulation Commands

Emulation Command	Supported	Notes
Next Transition (0x01, TX_NEXT)	✓	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)		• Not currently supported. The card always returns 03. • Audio is quiescent (01).
Transition Status (0x15, TX_STAT2)		• Not currently supported. The card always returns 03. • Audio is quiescent (01).
Crosspoint Take (0x06, XPT_TAKE)	✓	• **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 25** 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)	✓	**Keyer Select** byte value: Bit 4 is not supported **Keyer Modifier** byte value is supported as follows: • Bit 0 where 0 = Self, 1 = External • Bit 1 is not supported • Bit 2-4 is ignored **SqueezeBack** byte value is not supported.
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 checkbox. If you disable the Automation interface, there will be no response to commands including this one.
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.

Table 24 Supported GVG M-2100 Emulation Commands

Emulation Command	Supported	Notes
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 25 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 25 Crosspoint Take (0x06, XPT_TAKE)

Selecting Crosspoint	Selects
0x00	No Change
0x01	Black
0x05	BKGD A
0x06	BKGD B
0x07	Key Video
0x08	Key Alpha
0x09	Logo 1
0x0a	Alpha 1
0x0b	Logo 2
0x0c	Alpha 2
0x0d	Logo 3
0x0e	Alpha 3
0x0f	Logo 4
0x10	Alpha 4

Protocol Extensions

The following message types have been added for the MDK-111A-M. 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 "**Connection using RossLinq**") 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

Technical Specifications

This chapter provides information on the specifications for your MDK-111A-M.

✸ Note that specifications are subject to change without notice.

Technical Specifications

Table 26 provides the technical specifications when using the 8320AR-033 rear module.

Table 26 Technical Specifications — 8320AR-033 Rear Module

Category	Parameter	Specification
Serial Digital Video Inputs	Number of Inputs	4
	SDI Data Rates and SMPTE Standards Accommodated	• 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
Serial Digital Video 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 Consumption	Power Consumption	22W

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zlib

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The data format used by the zlib library is described by RFCs (Request for Comments) 1950 to 1952 in the files ftp://ds.internic.net/rfc/rfc1950.txt (zlib format), rfc1951.txt (deflate format) and rfc1952.txt (gzip format).

Service Information

This chapter provides information on the warranty and repair policy for your MDK-111A-M.

Troubleshooting Checklist

Routine maintenance to this openGear product is not required. In the event of problems with your MDK-111A-M, 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 in "**Contacting Technical Support**".

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-M is warranted to be free of any defect with respect to performance, quality, reliability, and workmanship for a period of FIVE (5) years from the date of shipment from our factory. In the event that your MDK-111A-M 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-M 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-M 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-M, 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-M. 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.

Glossary

The following terms are used throughout this guide:

- "**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 pillar box 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-M including all components and switches unless otherwise noted.
- "**DashBoard**" refers to the DashBoard Control System client software.
- "**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.
- "**Operator**" and "**User**" refers to the person who uses the MDK-111A-M.
- "**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 operate.