MB-652

2RU Monitoring Bridge

User Manual

ROSS

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    - offer the best product quality and support
2. Make Cool Practical Technology
    - develop great products that customers love

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

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

David Ross
CEO, Ross Video
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Ross Video Code of Ethics

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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.)*

MB-652 · User Manual

- Ross Part Number: MB652DR-004-04
- Release Date: January 16, 2018.

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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.

Safety Notices

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

EMC Notices

United States of America FCC Part 15

This equipment has been tested and found to comply with the limits for a class A Digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at their own expense.

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

Canada

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

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

Europe

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

Australia

This equipment has been tested to AS/NZS CISPR 22:2009 and found to comply with the limits for a Class A Digital device.

International

This equipment has been tested to CISPR 22:2009 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 product is not required. This product contains no user serviceable parts. If the module does not appear to be working properly, please contact Technical Support using the numbers listed under the "Contact Us" section on the last page of this manual. This product is covered by a generous 1-year warranty and will be repaired without charge for materials or labor within this period. See the "Warranty and Repair Policy" section in this manual for details.

Environmental Information

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

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

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

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

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Introduction

In This Chapter

The following topics are discussed:

- Overview
- Functional Block Diagrams
- User Interfaces

A Word of Thanks

Congratulations on choosing a Ross Video Monitoring Bridge. Thank you for joining the group of worldwide satisfied Ross Video customers!

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

Overview

Each MB-652 is a compact 3G/HD/SD SDI embedded audio monitoring system designed to extract up to 16 channels of embedded audio from an SDI signal for visual and aural monitoring.

The Monitoring Bridge features an intuitive user interface to allow for easy access to the signals and information you need to monitor.

A large vacuum fluorescent display on the front panel reports VU/PPM information, LKFS ITU1770-3/1771 loudness measurements, and true peak measurement. Input signal format data and mode selection information is also displayed.

Located directly beneath the display are 12 illuminated push-buttons to provide intuitive channel source and mode selection.

Also located on the front panel is a push to mute rotary shaft encoder for volume control and a 1/4” long-frame jack for headset monitoring.

High quality full range speakers and a Class D amplifier provide unparalleled performance.

One 3G/HD/SD SDI signal can be connected to the BNC on the rear panel while a reclocked output is available. Two 3-pin terminal block connectors also provide a stereo monitor output.

Features

The following features come standard on the MB-652:

- One 3G/HD/SD SDI input
- One reclocked SDI output
- One stereo monitor output
- Left, Right, SUM, Left Total/Right Total (Lt/Rt) downmix modes
- Push to Mute rotary shaft encoder
- High quality 1/4” long-frame headset jack
- 16 VU/PPM bar graph meters
- Provides ITU 1770-3/1771 LKFS measurements
- Full range speakers
- Class D power amplifier

Functional Block Diagrams

Figure 1.1 outlines the workflow of the MB-652.

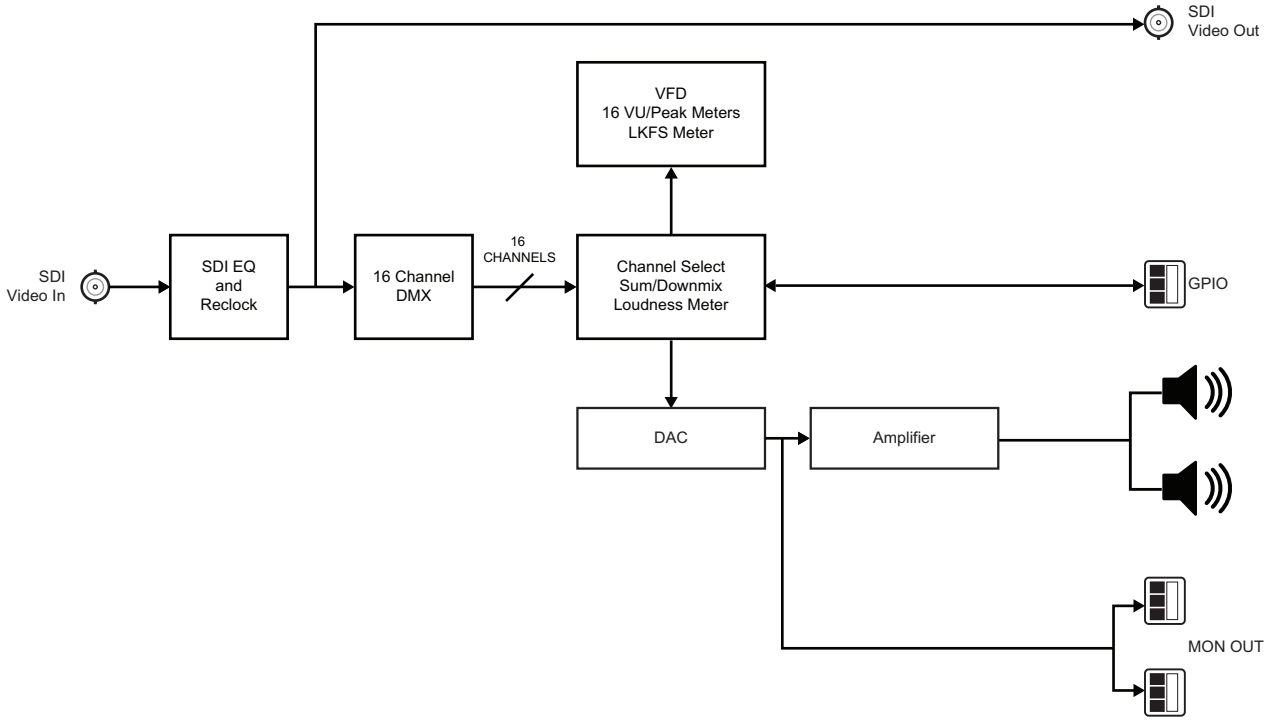


Figure 1.1 *MB-652 — Simplified Block Diagram*

User Interfaces

The MB-652 is intended to be controlled via the DashBoard client software, as well as through the physical controls on the panel.

DashBoard Control System

The DashBoard client software enables you to monitor and configure the MB-652 from a computer. The DashBoard software is available for download from our website.

The MB-652 includes two DashBoard interfaces: Network Connect and MB-652. Both interfaces are accessed by expanding the MB-652 node in the DashBoard Tree View and selecting the appropriate sub-node. The Network Connect interface enables you to set up ethernet communications, and monitor those communications. The MB-652 interface includes operational controls for the physical panel such as selecting the input source for the speakers and adjusting the volume level for the speakers.

For More Information on...

- configuring the MB-652 for network communication, refer to the section "**Network Configuration**" on page 3-7.
- menus in DashBoard for the MB-652, refer to the chapter "**DashBoard Menus**" on page 4-1.
- installing and using DashBoard, refer to the ***DashBoard User Manual***.

Controls on the Physical Panel

The front panel of the MB-652 provides the ability to monitor the LKFS and true peak values, the input signal format, and meters that represent VU/PPM data and loudness measurements. Buttons are provided to routing audio sources to the speakers, selecting the operating mode, and volume control.

The rear panel provides connections for the power supply, BNCs for the SDI input and output, and two 3-pin blocks for monitoring the analog audio.

For More Information on...

- the control and monitoring features of the front panel, refer to the section "**Front Panel Overview**" on page 2-3.
- the connections provided on the rear panel, refer to the section "**Rear Panel Overview**" on page 2-4.

Installation

In This Chapter

This chapter provides instructions for the physical installation of your MB-652, and basic cabling for the MB-652.

- Before You Begin
- Front Panel Overview
- Rear Panel Overview
- Physical Installation
- Configuring the DIP Switches

Before You Begin

Before you begin, ensure to review the following sections.

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 MB-652 you received from the shipping container and ensure that all items are included. If any items are missing or damage, contact your sales representative or Ross Video directly.

Front Panel Overview

This section briefly summarizes the features of the front panel.

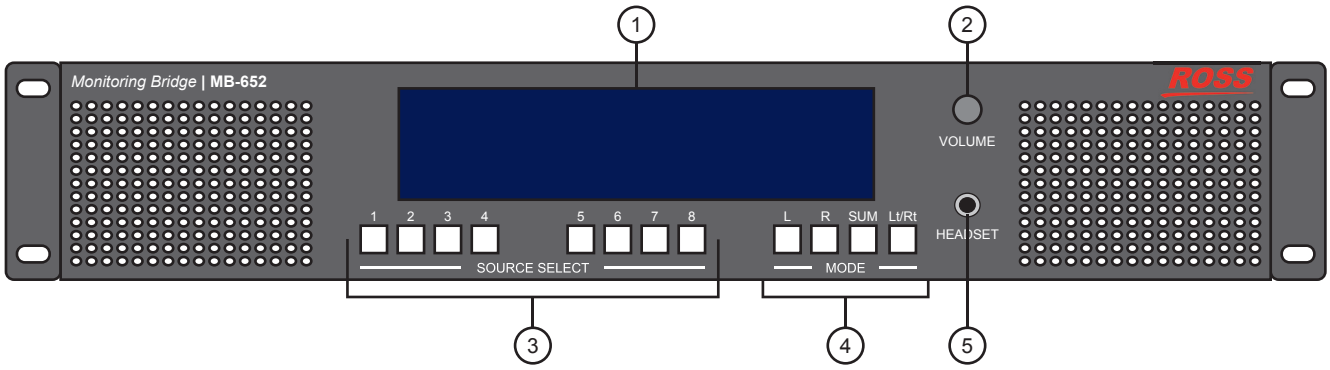


Figure 2.1 *MB-652 — Front Panel*

1) Display Panel	3) Source Select Buttons	5) Headset Jack
2) Volume Control	4) Mode Select Buttons	

1. Display Panel

This vacuum fluorescent display panel displays the audio meters and input signal information. The following information is displayed:

- 16 bar graph VU/PPM meters
- a bar graph meter that reports LKFS ITU 1770-3/1771 loudness measurements
- a numerical readout of the LKFS and true peak measurement
- the input signal format

2. Volume Control

Turn the knob to control the volume. Push the knob to mute the audio.

3. Source Select Buttons

This row of eight push-buttons enable you to route the corresponding source to the speakers of the MB-652. Refer to the section "**Channel Source Selection**" on page 3-9 for details.

4. Mode Select Buttons

This row of four push-buttons enable you to quickly specify the operating mode of the MB-652. Refer to the section "**Mode Selection**" on page 3-9 for details.

5. Headset Jack

This is a long-frame 1/4" headset jack. When in use, the internal speakers of the MB-652 are muted.

Rear Panel Overview

This section briefly summarizes the features of the rear panel.

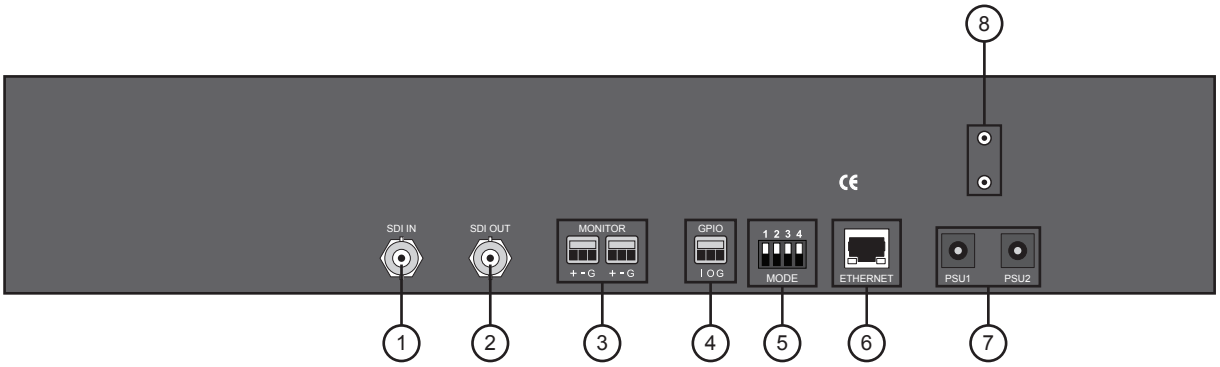


***Figure 2.2** MB-652 — Rear Panel*

1) SDI IN BNC	4) GPIO Port	7) Power Supply Connections
2) SDI OUT BNC	5) DIP Switches	8) Power Cord Bracket Inserts
3) MONITOR Ports	6) ETHERNET Port	

1. SDI IN BNC

This is the 3G/HD/SD SDI input signal.

2. SDI OUT BNC

This is a reclocked copy of the SDI input signal.

3. MONITOR Ports

These connectors provide analog audio. For a -20dBFS input, there will be a +4dBu output.

Note — *If replacement 3-pin plugs are required, contact Ross Technical Support and order Ross part number 30-01089.*

4. GPIO Port

Shorting the **I** pin to the **G** pin will mute the front speakers, and the audio level on the rear monitor ports will be controlled by the front volume knob.

5. DIP Switches

SW1 and **SW2** are used in conjunction with the DashBoard menus to set the IP Address of the MB-652. Refer to the section "**Configuring the DIP Switches**" on page 2-8 for details.

SW3 is used to override the Master Password for the MB-652. This password limits access to the MB-652.

6. ETHERNET Port

Each MB-652 includes an **Ethernet** port on the rear panel that is used for communication with DashBoard and software upgrades via DashBoard.

7. Power Supply Connections

These are the connectors for the primary (**PSU1**) and optional redundant (**PSU2**) supplies.

8. Power Cord Bracket Inserts

Install the provided brackets to help retain the power cords to the MB-652 chassis.

For More Information on...

- power supplies for the MB-652, refer to the section "**Power Supplies**" on page 2-6.
- MB-652 power consumption, refer to the section "**Technical Specifications**" on page 5-2.

Physical Installation

The MB-652 mounts in the rack frame by means of four rack screws fastened through the front mounting ears. This should normally be sufficient to carry the load, including the weight of accompanying cables. Note that the MB-652 installs in a standard 19” rack.

Installation Requirements

Keep the following in mind when installing your MB-652:

- Install the MB-652 for maximum stability during operation and in such a way as to allow adequate ventilation.
- The MB-652 cannot be sealed in a closed container and must be installed in free air space where the ambient temperature is monitored and controlled to not exceed 40°C (104°F).
- Ensure that adequate space exists in front and behind the MB-652 and on both sides of the frame for airflow.
- The location of the MB-652 should be accessible, dry, and dust-free.

Table 2.1 Frame Dimensions

Model	Rack Units	Height	Depth	Width
MB-652	2 RU	3.5” (8.89cm)	8.5” (21.59cm)	19” (48.26cm)

Power Supplies

The MB-652 comes standard with one power supply and one A/C power cable. A redundant power supply is available as an option. The MB-652 power supply is a power factor corrected supply, capable of working with all world AC standards (100-240V).

This section includes information for connecting the power cables for the MB-652.

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

Warning — *In some countries, it may be necessary to supply the correct mains supply cord. Use only an approved IEC 320 C-13 type A/C line cord rated for a minimum 10A at 250V and certified for the country of use.*

To connect the power cables for the MB-652

1. For each power cable, install the provided cable clamp (929-006R) and machine screw (850-005R) to help retain the power cable connectors to the rear of the MB-652 chassis. These clamps and screws are included in the shipping container with the Monitoring Bridge.
2. Connect the DC plug to the power jack located on the rear panel of the MB-652. Refer to **Figure 2.2** for power connection location.
3. Connect the line cord to the power supply.
4. Connect the AC cord to an AC outlet.

Ethernet Cabling for the MB-652

The exact steps for connecting to your facility via an ethernet network depends on the network requirements of your facility.

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 the MB-652.

You will require a standard network CAT-5 cable to connect the MB-652 to your facility network. Ross Video does not supply this cable.

SDI Cabling

The rear panel includes one **SDI IN** BNC and one **SDI OUT** BNC.

Configuring the DIP Switches

This section briefly summarizes the **DIP Switch** settings on the MB-652. **Figure 2.3** shows the DIP Switches in the **UP** position.

***Figure 2.3** DIP Switches — Set to the UP Positions*

Setting the IP Address

SW1 and **SW2** are used in conjunction with the DashBoard menus to set the IP Address of the MB-652. Refer to **Table 2.2** for DIP Switch positions. For information on configuring the network settings for your MB-652, refer to the section "**Network Configuration**" on page 3-7.

Table 2.2 SW1 and SW2 Positions

SW1 Position	SW2 Position	Controlled via DashBoard	Descriptions
UP	**UP**	✓	The MB-652 network settings can be set by the user from the DashBoard **Network** tab[a]. (default)
UP	**DOWN**		The MB-652 network settings are automatically assigned (DHCP Mode).
DOWN	**UP**		The MB-652 IP Address is set to 192.168.2.1 and the Subnet Mask is set to 255.255.255.0.
DOWN	**DOWN**		The MB-652 IP Address is set to 10.1.2.1. and the Subnet Mask is set to 255.255.255.0.

a. DHCP Mode is assumed until the user changes the settings in DashBoard.

Master Password Override

SW3 is used to override the Master Password and allows a user to reset the Master Password. Refer to the section "**Using a Master Password in DashBoard**" on page 3-5 for details.

- **UP** — This is the recommended position. A user-specified Master Password is used. The default password is **`password`**. It can be changed using DashBoard as outlined in the the section "**Setting the Master Password**" on page 3-5.
- **DOWN** — This position is used to recover a lost Master Password. The user-specified password is temporarily ignored, and the default value of **`password`** is used.

SW4

SW4 is not implemented at this time and should be left in the **UP** position.

Configuration

In This Chapter

This chapter provides instructions to configure basic communications for your MB-652.

The following topics are discussed:

- Using the Front Panel Display
- Using DashBoard
- Using a Master Password in DashBoard
- Network Configuration
- Audio Configuration
- Monitoring the Loudness Value
- Software Upgrades

Using the Front Panel Display

This section provides a brief summary of the display panel located on the front of the MB-652. From this panel you can monitor the MB-652.

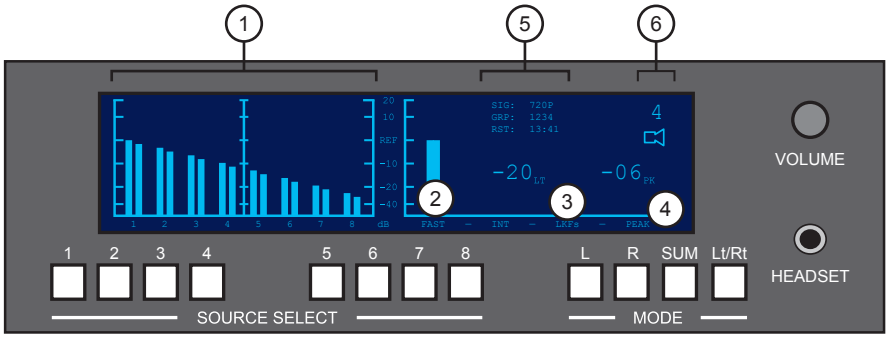


Figure 3.1 *MB-652 Front Panel — Display*

1) Audio Channel Bar Graph	3) Long Term Readout Time	5) Signal Data Display
2) FAST Bar Graph	4) True Peak Readout	6) Speaker Volume

1. Audio Channel Bar Graph

This sixteen channel bar graph represents the VU/PPM meter where reference can be -20dBFS (the default value) or -18dBFS. This value can be set in DashBoard via the Settings tab as outlined in **Table 4.7** on page 4-5.

2. FAST Bar Graph

This ITU 1770-3 LKFS bar graph reports the FAST 1 second integration time.

3. Long Term Readout Time

This value is configurable via the options on the LKFS tab in DashBoard.

- ITU 1770 LKFS non gated moving variable. (1 to 30 seconds)
- ITU 1770-2 LKFS gated moving loudness (LT). (30 seconds)
- ITU 1770-2 LKFS gated window (LT). (1-1200 seconds)

4. True Peak Readout

This value is the ITU 1770-3 LKFS numerical read-out of the true peak (PK).

5. Signal Data Display

This area includes the following fields:

- **SIG** field — Displays the type of SDI signal.
- **GRP** field — Indicates which groups of audio are present.
- **RST** field — Represents the timer and is configured via the Front Panel Display options on the LKFS tab in DashBoard as follows:
  - › This field is reset each time you select a different source.
  - › If the **Front Panel Display** is set to **Var Win**, it will display the window set time.
  - › If the **Front Panel Display** is set to **Gated Win**, a fixed 30sec window will be indicated.
  - › If the **Front Panel Display** is set to **Integrated**, it will count to the Gate Time value (on the LKFS tab in DashBoard), and stop.

6. Speaker Volume

This area represents the speaker volume level. A flashing number with an **X** underneath it indicates that the speakers are muted (the **VOLUME** control knob was pushed inwards).

Using DashBoard

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

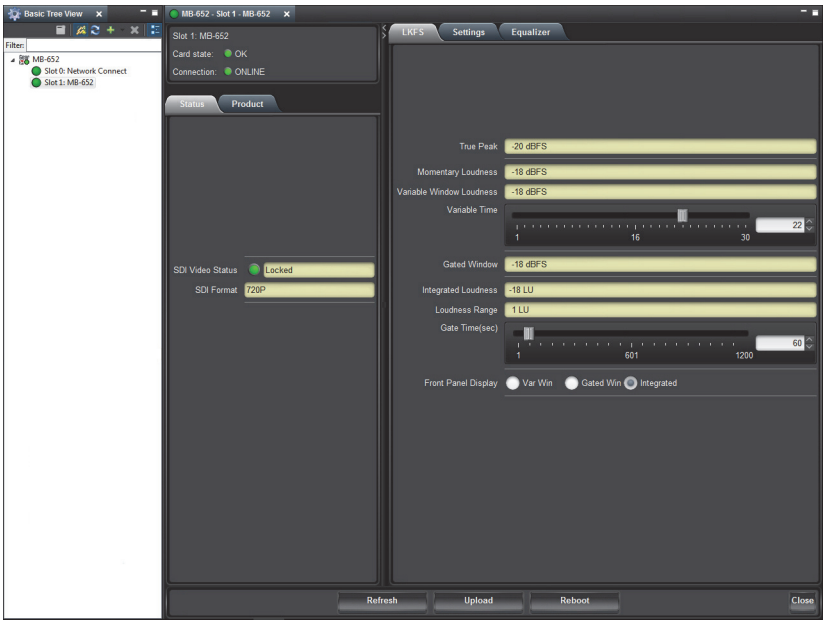
The MB-652 provides two interfaces in DashBoard that display as nodes in the Tree View under the MB-652. The Network Connect interface (Slot 0 node) provides menus for configuring the communication settings for the MB-652. The MB-651/MB-652 interface (Slot 1 node) enables you to set up the audio features for the physical panel.

To launch DashBoard

1. Ensure that you are running DashBoard software version 6.2.0 or higher. The software and ***DashBoard User Manual*** are available from the Ross Video website.
2. Launch DashBoard by double-clicking its icon on your desktop.
3. Locate the MB-652 in the Tree View of DashBoard.

To access the MB-652 interface

1. From the **Tree View**, expand the node for the MB-652 you wish to access.
2. Select the **Slot 0** node to display the network configuration options for the MB-652 in the right-half of DashBoard.
3. Select the **Slot 1** node to display the audio interface in the right-half of DashBoard.



Example of an MB-652 in DashBoard

Using a Master Password in DashBoard

Right-clicking the MB-652 node in the tree view of DashBoard provides the option to **Lock/Unlock Access** which requires the user to enter a Master Password before gaining access to the MB-652 This Master Password can be the same for all MB-652s listed in the DashBoard client, or unique to each MB-652, or a mix.

When using the DashBoard Server and URM, MB-652 nodes in the Tree View display a lock icon to inform the user that restrictions are in place. This lock icon indicates that the node is locked and requires a Master Password, or that the user must log into the DashBoard client with a valid user account, to gain access to the node.

For More Information on...

- the lock icon, refer to the ***DashBoard Server and URM User Manual***.

Setting the Master Password

Right-clicking a MB-652 node in the Tree View of DashBoard provides the option to Lock/Unlock Access which requires the user to enter a Master Password before gaining access to the MB-652.

Setting the DIP Switch

Your MB-652 includes **SW3** (a DIP Switch) that enables you to override the Master Password.

Use this DIP switch when the Master Password needs to be reset (e.g. when you have forgotten the password text). If you change the configuration of the DIP Switch, you must reboot the MB-652 before the changes take effect.

Override the Master Password using the DIP Switch as follows:

- **UP** — This is the recommended position. A user-specified Master Password is used.The default password is `password`. It can be changed using DashBoard as outlined in the section "**To set a new master password for the MB-652**" on page 3-5.
- **DOWN** — This position is used to recover a lost Master Password. The user-specified password is temporarily ignored, and the default value of password is used.

To set a new master password for the MB-652

1. From the **Tree View**, right-click the node for the MB-652 you want to access.
2. Select **Lock/Unlock Access** to display the **Change Master Password** dialog.
3. From the provided list, select the check box for the MB-652 you wish to change the password for.
4. Type the current password in the **Old Password** field.
5. Type the new password in the **New Password** field.
6. Type the new password in the **Confirm** field.
7. Click **OK**.

Accessing a MB-652

You can access a MB-652 using your user account, assuming you have permissions to do so. If DashBoard URM is implemented in your facility and your DashBoard client is version 4.0.0 or

higher, you log in as outlined in the procedure "**To use a valid user account**". If DashBoard URM is unavailable, or when using the DashBoard Lite applet, you log in as outlined in the procedure "**To use the Master Password**".

To use a valid user account

1. Launch the DashBoard client on your computer.
2. Log into the DashBoard client with your user account and password.
3. Navigate to the MB-652 in the Tree View of the DashBoard client.

To use the Master Password

1. Launch the DashBoard client on your computer.
2. Navigate to a locked MB-652 displayed in the Tree View of the DashBoard client.
3. Double-click the MB-652 node to display the **Password Required** dialog. You can also double-click the MB-652 name and select **Open**.
4. Enter the Master Password for the MB-652 in the provided field.
5. Select one of the following methods:
   - Click **Try Password** to connect to the selected MB-652; or
   - Click **Try for All** to connect to all locked MB-652s displayed in the Tree View. Only when you attempt to connect to additional locked MB-652s and the login fails, are you prompted for the password.
6. If the password was incorrect, an error message displays to prompt you for another log in attempt.

Network Configuration

Each MB-652 includes an **Ethernet** port on the rear panel that is used for communication with DashBoard and software upgrades.

Before You Begin

Verify the positions of **SW1** and **SW2** on the rear panel. These DIP switches assign the IP address for your MB-652. Refer to the section "**Setting the IP Address**" on page 2-8 for details.

Automatic Configuration using DHCP

This method assumes that the MB-652 is using the factory default values for the network settings.

To establish communications with the MB-652

1. Ensure that the MB-652 is connected to the same network as your DashBoard computer.
2. Launch the DashBoard application on your computer.
3. Power on the MB-652.
4. Wait approximately 30 seconds while the MB-652 establishes network communications.
5. Verify that the MB-652 displays in the Tree View of DashBoard.
6. Should the MB-652 fail to display after two minutes:
   - Verify the ethernet cables are properly connected.
   - Check the link/activity LEDs found on the ethernet RJ-45 connector.
   - Ensure the network settings for the MB-652 are set to the factory default values.
   - If all cables are connected and the LEDs do not indicate an error, then automatic configuration is not possible.

Custom User Configuration via DashBoard

Once communication has been establish with the MB-652, the network settings may be further adjusted using the following procedure. Note that the steps are optional, you may perform as many, or as few, as needed.

To configure the network settings via DashBoard

1. From the **Tree View**, expand the node for the MB-652 you want to access.
2. Select the **Network Connect** node to display the interface in the right-half of DashBoard.The **Network** setup tab is automatically displayed.
3. To change the **Network Time Server** address, enter the new IP Address in the **NTP Server** field.
4. To change between **Static** and **DHCP** addressing, select an option in the **Addressing Mode** area.
5. Configure the network settings as required:
   - **IP Address** — This is the IP Address of the MB-652.
   - **Subnet Mask** — This is the Subnet Mask address for your LAN.

- **Default Gateway** — This is the IP Address for connection outside the subnet.

6. To save the new settings, click **Apply** in the **Network** setup tab. The settings are saved immediately and take effect.

Audio Configuration

This section provides information for specifying the channels to monitor and configuring the operating mode.

Channel Source Selection

Selecting the audio channels you want to monitor is provided by eight push-buttons located directly below the audio meters allowing the user to intuitively select whichever stereo pair they would like to route to the speakers.

Push-buttons numbered 1-8 allow the user to select the embedded audio pairs.

Mode Selection

The four push-buttons located to the right side of the source selection switches are for the mode selection.

Table 3.1 Mode Selection

Mode	Description
L only	Routes the Left Channel of the selected source to both speakers
R only	Routes the Right Channel of the selected source to both speakers
SUM	Allows any of the channels to be summed together to monitor more than one source at a time
Lt/Rt	Provides an Lt/Rt downmix of your 5.1 surround mix. Select the pair where your 5.1 mix starts then press the Lt/Rt button the unit then selects the two pairs beside it and creates the downmix from these 6 channels.

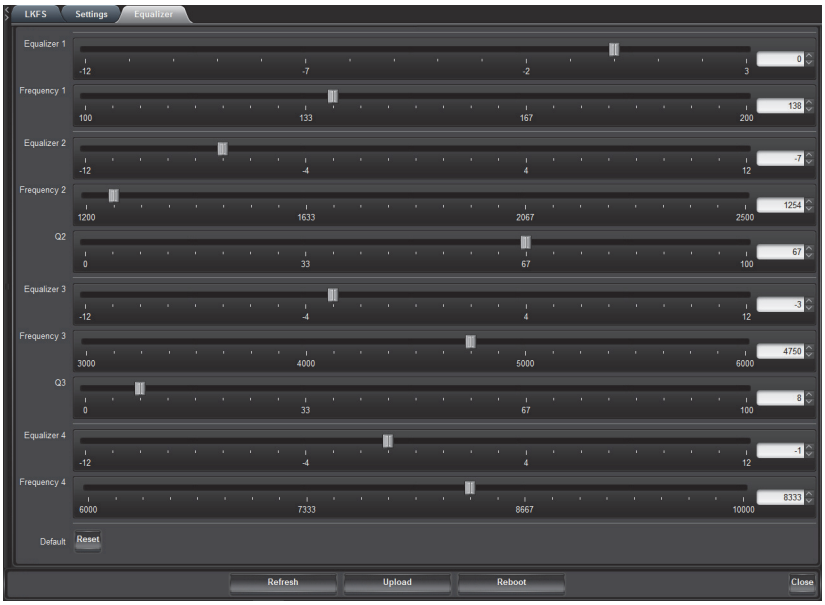
Adjusting the EQ Levels

The MB-652 includes a feature for attenuating the levels of different frequencies in an audio signal. This feature is a parametric 4-band equalizer where:

- Equalizer 1/Frequency 1 are the low shelf.
- Equalizer 2/Frequency 2 are the first mid-range band. This band includes a Q adjustment.
- Equalizer 3/Frequency 3 are the second mid-range band. This band includes a Q adjustment.
- Equalizer 4/Frequency 4 are the high shelf.

To adjust an equalizer band

1. From the **Tree View**, expand the node for the MB-652 you wish to access.
2. Select the **Slot 1** node to display the audio interface in the right-half of DashBoard.
3. Select the **Equalizer** tab.



MB-652 Interface — Equalizer Tab

4. Use the **Equalizer** slider for a band to adjust the gain.
5. Use the **Frequency** slider for a band to as follows:
   - For Frequency 1 and 4, use the slider to adjust the 3dBF point.
   - For Frequency 2 and 3, use the slider to adjust the center point of the equalizer.
6. For Equalizer 2 and/or 3, use the **Q** slider to determine how sharp the filter will be where Q is adjusted from high-to-low.

Line Out Control

The MB-652 provides a Volume Control knob on the front panel that provides volume and mute controls The GPIO Port on the rear panel determines whether to mute the front speakers, or whether the audio level on the rear monitor ports will be controlled by the front volume knob.

In DashBoard, the Control tab provides the option to override the GPIO Port settings as follows:

- Toggle the **Line Out** button to **Variable** — Adjust the amplitude via the Volume Control knob on the front panel. The GPIO Port setting is ignored.
- Toggle the **Line Out** button to **Fixed** — The output amplitude is fixed, unless overridden by the GPIO Port setting, to the value listed in **Table 5.1** on page 5-2.

Monitoring the Loudness Value

The LEQ algorithm calculates values for programs consisting of 1 to 5 channels. Gains are designed for 5.1 program audio so that channels 4 and 5 have a special gain factor of 1.41 (used in multi-mode).

The MB-652 loudness algorithm reports the following output values in DashBoard:

1. True peak.
2. LEQ Average 1, Momentary (1 second)
3. LEQ Average 3, Variable (1-30 seconds)
4. Integrated Continuous Gated moving window, Variable (1-30 seconds)
5. Integrated Gated Loudness window (1770-2)
6. Loudness Range, EBU-128R

Software Upgrades

This section provides instructions for upgrading the software for your MB-652 using DashBoard.

To upload software to the MB-652

1. Contact Ross Technical Support for the latest software version file.
2. Launch DashBoard on the computer communicating with the MB-652.
3. From the **Tree View**, expand the node for the MB-652 you want to access.
4. Select the node to display the corresponding interface in the right-half of DashBoard.
5. Click **Upload** to display the **Select File for upload** dialog box.
6. Navigate to the *.bin upload file you wish to upload. DashBoard automatically selects the last directory that you loaded from.
7. Click **Open** to display a confirmation dialog box. This dialog box displays the selected upload file name, type, size, and the file creation date.
8. From the **Confirmation** dialog box, select one of the following:
   - **Cancel** — Select this option to cancel the upload of the file and return to the **Device View**.
   - **Continue** — Select this option to upload the file. While uploading, an **Uploading Progress** dialog box opens.

Notice — *Clicking the **Cancel** button while uploading will leave the MB-652 in an invalid state. Do not click **Cancel** unless the uploading progress has stopped completely for 60 seconds or more.*

9. Monitor the upgrade progress bar displayed in DashBoard while the software is upgraded on your MB-652.
10. To complete the upgrade process, you must reboot the MB-652 as follows:
    - From the **Device** tab, click **Reboot** to reboot the MB-652.
    - The MB-652 automatically saves all your settings before starting the reboot process.
    - The status of the MB-652 is grayed out until the reboot process is complete.

DashBoard Menus

In This Chapter

This chapter provides information the DashBoard menus available for the MB-652. Default values are indicated with an asterisk (*). The DashBoard Control System enables you to setup an IP address for the MB-652 and monitor its status from a computer. You can download the DashBoard software and manual from the Ross Video website.

The following topics are discussed:

- Network Connect Interface
- MB-652 Interfaces

Network Connect Interface

This section summarizes the tabs displayed in DashBoard for the Network Connect Interface.

Device Tab

Table 4.1 summarizes the read-only information displayed in the **Device** tab.

Table 4.1 Device Tab Items

Tab Title	Item	Parameters	Description
Device	Device Name	MB-652	
	MAC Address	##-##-##-##-##-##	MAC Address for the MB-652
	Software Rev	#.##	Indicates the network connect software version

Network Tab

Table 4.2 summarizes the read-only information displayed in the **Network** status tab.

Table 4.2 Network Tab Items

Tab Title	Item	Parameters	Description
Current Settings	Network Source	DHCP - set by user	The **Addressing Mode** is set to **DHCP** in DashBoard. The network automatically assigns the MB-652 ethernet settings.
		Static - set by user	The **Addressing Mode** is set to **Static** in DashBoard. User defines the ethernet settings from the **Network** tab.
	IP Address	##.#.###.###	IP Address of the MB-652
	Subnet Mask	###.###.#.#	Subnet Mask for the MB-652
	Default Gateway	##.#.#.#	MB-652 gateway
	NTP Server	##.#.#.#	IP Address of the NTP server used as a time source
Connection Management	Access Mode	Open	No access restrictions; the MB-652 accepts connections from all DashBoard clients
		Authenticated Only	Access control enabled; only DashBoard clients version 4.0.0 or higher can connect. The user must be authenticated by the DashBoard Server and URM, or must know the Master Password of the MB-652.

Table 4.2 Network Tab Items

Tab Title	Item	Parameters	Description
Connection Management	Master Password	********	Indicates that a user-specified password is set for the MB-652
	Active Connections	#	Number of external control devices, such as DashBoard, connected via TCP to the MB-652
Internal Bus Status	Active Cards	#	Reports on the sub-nodes in the Tree View of the MB-652
	Bus Load (%)	#	Communication traffic of the internal CAN Bus of the MB-652. A high value indicates a high amount of traffic.

Network Tab

Table 4.3 summarizes the **Network** configuration options available in the Network Connect interface in DashBoard.

Table 4.3 Network Menu Items

Menu Title	Item	Parameters	Description
Network	Device Name	#	Assigns a unique identifier for your MB-652. The Device Name is automatically updated in the Product tab, Tree View, and tab titles.
	NTP Server	##.#.#.#	This is the IP Address of the NTP server used as a time source
	Current DIP Switch (read-only)	User Settings	This field is fixed.
	Addressing Mode	Static	User defines the Network settings of the MB-652
		DHCP*	DashBoard obtains network settings automatically for the MB-652
	IP Address	##.#.#.###	Enables you to set the IP Address of the MB-652 if the **Addressing Mode** is set to **Static**.
	Subnet Mask	###.###.###.#	Enables you to set the Subnet Mask of the MB-652 if the **Addressing Mode** is set to **Static**
	Default Gateway	##.#.#.#	Enables you to set the Default Gateway of the MB-652 if the **Addressing Mode** is set to **Static**
	Apply		Applies and saves any changes made to the **Network Settings**
	Cancel		Cancels any setting changes and resets the **Network Settings** to the previous values

MB-652 Interfaces

This section summarizes the tabs displayed in DashBoard for the MB-652 interface.

Status Tab

Table 4.1 summarizes the read-only information displayed in the **Status** tab.

Table 4.4 Status Tab Items

Tab Title	Item	Parameters	Description
Status	SDI Video Status	Locked (Green)	MB-652 is locked to the input signal
		Unlocked (Red)	MB-652 is not locked to the input signal
	SDI Format	#	Indicates the input video format

Product Tab

Table 4.5 summarizes the read-only information displayed in the **Product** tab.

Table 4.5 Product Tab Items

Tab Title	Item	Parameters	Description
Product	Card Name	Audio Bridge	
	Product	MB-652	Indicates the model of the MB-652
	Supplier	Ross Video Ltd.	
	Serial Number	#########	Indicates the MB-652 serial number
	Software Rev	#.##	Indicates the MB-652 software version
	DSP Rev	#.##	
	FPGA Rev	#.##	

LKFS Tab

Table 4.6 summarizes the read-only information displayed in the **LKFS** tab.

Table 4.6 LKFS Tab Items

Tab Title	Item	Parameters	Description
	Momentary Loudness	#dBFS	Specifies the (fixed) 1sec non-gated rating based on ITU-1770-3
	Variable Window Loudness	#dBFS	Specifies the variable non-gated rating based on ITU-1770-3
	Variable Time	#	Specifies the Variable Window size (in seconds) for the Variable Window Loudness
	True Peak	#dBFS	Indicates the ITU 1770-3 LKFS numerical readout of the true peak (PK)
	Gated Window	#dBFS	Defines the gated ITU-1770-3 moving 30sec window

Table 4.6 LKFS Tab Items

Tab Title	Item	Parameters	Description
	Integrated Loudness	#LU, mm:ss	**#LU** represents the gated program rating based on ITU-1770-3 **mm:ss** represents the number of minutes and seconds the since current #LU was measured
	Loudness Range	#LU	Specifies the integrated program range based on EBU-R128
	Gate Time (sec)	#	Specifies the gated program time (in seconds) for the Integrated Loudness and Loudness range fields
	Front Panel Display	Var Win	The RST field on the front panel display reports the Variable Window Loudness range
		Gated Win	The RST field on the front panel display reports the fixed 30sec gated window range
		Integrated	The RST field on the front panel display counts until it reaches the Gate Time value
	LKFS	Reset	Resets all fields on the LKFS tab

Settings Tab

Table 4.7 summarizes the options available in **Settings** tab in DashBoard.

Table 4.7 Settings Tab Items

Tab Title	Item	Parameters	Description
	Channel	#	Specifies the audio channel to route to the speakers
	Mode[a]	Stereo	Outputs the channel pair
		SUM	Allows any of the channels to be summed together to monitor more than one source at a time
		Lt/Rt	Outputs an Lt/Rt downmix of your 5.1 surround mix
	Volume	#	Sets the volume level of the speakers.
	Line Out	Variable	Adjusts the amplitude as dictated by the Volume Control knob on the front panel
		Fixed	
	Meter Reference	-20*	Sets the front panel VU/PPM meter reference value
		-18	

a. This feature is not implemented in DashBoard.

Equalizer Tab

Table 4.8 summarizes the options available in **Equalizer** tab in DashBoard.

Table 4.8 Equalizer Tab Items

Tab Title	Item	Parameters	Description
Equalizer	Equalizer #	#	Adjusts the gain of that audio band
	Frequency #	#	Adjusts the frequency of the equalizer
	Q#	#	Specifies how sharp the filter will be. Moving the slider to the left sharpens the filter, while moving the slider to the right widens the filter.
	Default	Reset	Resets all values on the Equalizer tab to the default values listed in **Table 4.9**

Default Values

Table 4.9 lists the default values for the equalizer.

Table 4.9 Equalizer Menu Default Values

Type	Default
Equalizer 1	0
Frequency 1	150
Equalizer 2	0
Frequency 2	1850
Q2	50
Equalizer 3	0
Frequency 3	4500
Q3	50
Equalizer 4	0
Frequency 4	8000

Specifications

In This Appendix

This appendix provides information on the specifications for your MB-652. Note that specifications are subject to change without notice.

The following topics are discussed:

- Technical Specifications

Technical Specifications

This section provides the technical specifications for the MB-652.

Table 5.1 MB-652 Technical Specifications

Category	Parameter	Specification
SDI Input and Output	Number of Inputs	1
	Number of Outputs	1
	Standards Accommodated	Reclocked SMPTE 259M, SMPTE 292M, SMPTE 424M
	Connector Type	75ohm BNC
	Signal Level	800mV nominal
	Return Loss	-10dB to 3G
Analog Audio Monitor Output	Number of Outputs	2
	Connector Type	3-pin terminal blocks for left and right output
	Output Reference Level	-20dBFS = +4dBu
	Output Frequency Response	+/-0.5dB 20Hz to 20kHz
	Analog Output Distortion	<0.01% THD + N (20Hz to 20kHz)
Dimensions	Width	19” (48cm)
	Height	3.5” (9cm)
	Depth	8.5” (22cm)
	Weight (approximate)	8lbs (3.6kg)
Power	Power Consumption	90-240 VAC 50/60Hz 90W

Service Information

In This Chapter

This chapter contains the following sections:

- Troubleshooting Checklist
- Warranty and Repair Policy

Troubleshooting Checklist

Routine maintenance to the MB-652 is not required. In the event of problems with your MB-652, the following basic troubleshooting checklist may help identify the source of the problem. If the MB-652 still does not appear to be working properly after checking all possible causes, please contact your Ross Video products distributor, or the Technical Support department at the numbers listed in the section "**Contact Us**".

1. **Visual Review** — Performing a quick visual check may reveal many problems, such as connectors not properly seated or loose cables. Check the MB-652, and any associated peripheral equipment for signs of trouble.
2. **Power Check** — Verify that the power cable is connected to a power source and that power is available at the power main.
3. **Input Signal Status** — Verify that source equipment is operating correctly and that a valid signal is being supplied.
4. **Output Signal Path** — Verify that destination equipment is operating correctly and receiving a valid signal.
5. **Unit Exchange** — Exchanging a suspect unit with a unit that is known to be working correctly is an efficient method for localizing problems to individual units. ‘

Warranty and Repair Policy

The MB-652 is warranted to be free of any defect with respect to performance, quality, reliability, and workmanship for a period of one (1) year from the date of shipment from our factory. In the event that your MB-652 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 MB-652 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 ONE (1) 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 MB-652 User Manual provides all pertinent information for the safe installation and operation of your MB-652. Ross Video policy dictates that all repairs to the MB-652 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 MB-652, 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 MB-652. If required, a temporary replacement 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.

Contact Us

Contact our friendly and professional support representatives for the following:

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

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