

### Shipment Summary

Your master control shipment contains one or more master control products, power cords, miscellaneous cabling, a software and documentation CD, and this printed Quickstart Guide.

NV5100MC frames ship with the I/O cards, MCEs, and MCPMs you ordered already installed and tested.

You should, of course, inspect the shipment for content and damage. You should also copy all the documentation from the SB0243 CD to a secure place in your facility's file system.

(Imagestore 750s, Intuition XGs, and Kaleido-X equipment ship separately from NV5100MC frames, MCEs, and MCPMs. Documentation and software for those products also ships separately.)

It is to your advantage to become familiar with the documentation at an early point in your system development.

In addition to this Quickstart Guide, there are several manuals and user's guides on the software and documentation CD:

#### Configuration Guides and Technical Information

UG0061	MasterConfig User's Guide
UG0062	MasterDiag User's Guide
UG0063	MasterLogo User's Guide
UG0064	<i>Master Control Installation Guide</i>
UG0065	<i>Master Control Reference Manual</i>
UG0066	MCS Panel Configuration Editor User's Guide
UG0067	Device Controller User's Guide
UG0068	Tally Processor User's Guide

#### Panel Operators' Guides

UG0053	iMC-Panel-GUI Operator's Guide for Imagestore 750
UG0069	iMC-Panel-100 Operator's Guide for Imagestore 750.
UG0054	iMC-Panel-200 Operator's Guide for Imagestore 750
UG0055	iMC-Panel-300 Operator's Guide for Imagestore 750
UG0057	iMC-Panel-GUI Operator's Guide for MCEs and MCPMs.
UG0070	iMC-Panel-100 Operator's Guide for MCEs and MCPMs.
UG0058	iMC-Panel-200 Operator's Guide for MCEs and MCPMs.
UG0059	iMC-Panel-300 Operator's Guide for MCEs and MCPMs.

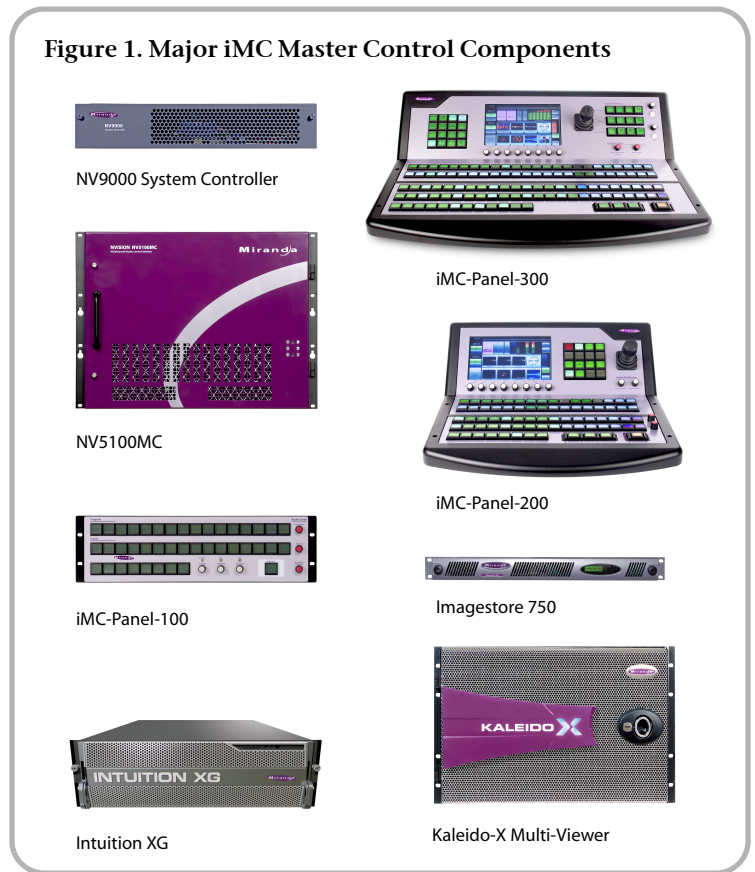
Other documentation, in particular, the *Imagestore 750 Reference Manual* is not included on the CD. However, all documentation is available from the Miranda website.

### QuickStart Road map

The goal of this Quickstart Guide is to provide you with an understanding of the iMC master control system.

To *install* iMC components, follow the instructions and guidelines in the Master Control Installation Guide.

Figure 1. Major iMC Master Control Components



To *configure* iMC components, follow the instructions in the applicable configuration guide.

The Master Control Reference Manual contains architectural information and theory of operation.

The various panel operator's guides apply to specific control panels and situations.

You should survey the documentation to become acquainted with all the concepts and then focus on individual tasks.

Topics covered here, in order, are

- 1 The product offering.
- 2 The master control feature set.  
What the master control devices are, where the connectors are and what they do, etc.
- 3 Configuration software.  
A brief survey of what the configuration applications do.  
How to install the software and documentation.
- 4 Creating a master control network.  
This includes a few other hardware connections, too.
- 5 Making Imagestore 750 connections.
- 6 NV5100MC details.  
Further detail about master control features.

## The Product Offering

iMC integrates Imagestore 750s and MCEs (in NV5100MC frames) in a single master control system. The iMC system is designed to be used in 3 ways:

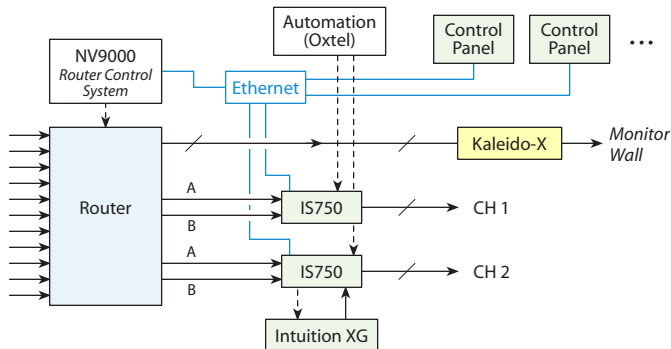
- Imagestore 750s only.
- MCEs (and possibly MCPMs) only.
- Both Imagestore 750s and MCEs (and MCPMs).

Imagestore 750s, MCEs, and MCPMs are transition processors, sometimes called channel branding processors, that execute transition between video sources, imposing video effects and voice-over as needed. A transition processor is considered a *channel*.

MCE stands for “master control engine.” MCPM stands for “master control processing module.” MCEs are more advanced models of MCPMs.

### Imagestore 750s Only

A system of Imagestore 750s only requires a video router that supports embedded audio and an NV000 router control system. The NV9000, the Imagestore 750s and control panels are connected on an Ethernet LAN.



Directed by control panel operators, the Imagestore 750s issue commands to the NV9000, which takes the appropriate signals to the A and B inputs of the Imagestore 750s and also to the Kaleido-X multi-viewer driving a monitor wall.

The Imagestore 750s are typically controlled by an automation system using the Oxtel protocol. Master control panels can override automation.

Imagestore 750s can receive advanced graphics from Intuition XG graphics processors.

### MCEs and MCPMs Only

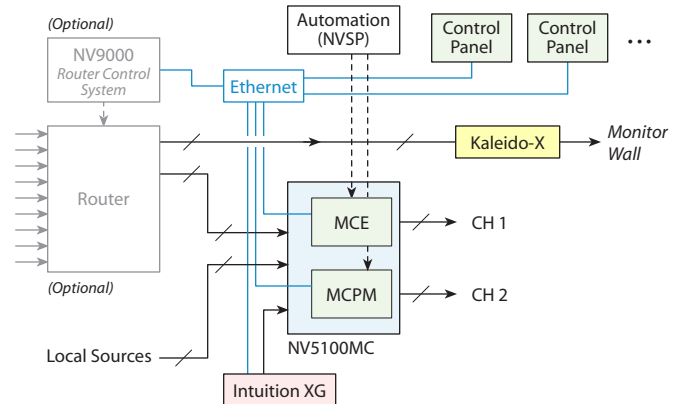
A system of only MCEs (and MCPMs) requires one or more NV5100MC frames. A router and an NV000 router control system are not required. However, the NV9000 can provide useful functions if it is present.

The MCEs, MCPMs, and control panels are connected on an Ethernet LAN.

Directed by control panel operators, MCEs combine video sources connected at the backplane of the NV5100MC frame. The frame can contain a small multi-format router which can be used to advantage for master control functions.

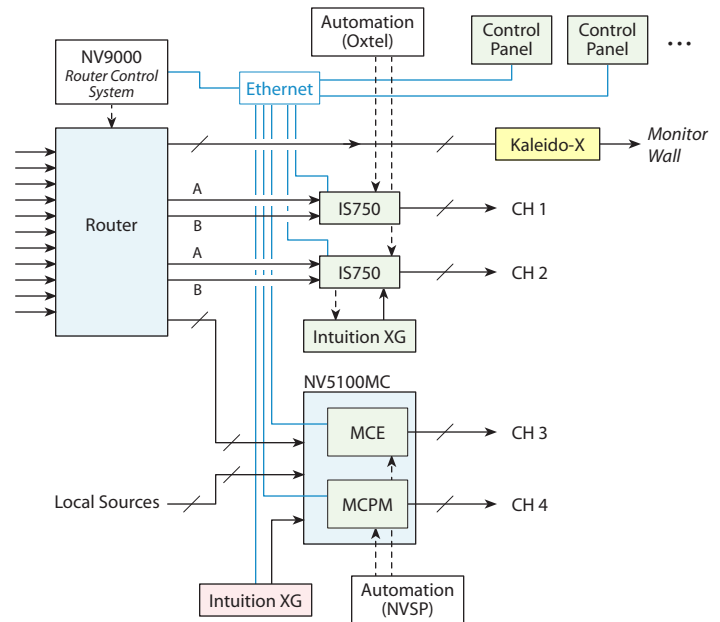
The Imagestore 750s are typically controlled by an automation system using the NVISION master control protocol.

MCEs can receive input from Intuition XG graphics processors. (MCPMs cannot.)



### Combined System

When a system employs both Imagestore 750s and MCEs (and MCPMs), the control panels can control either.



## Master Control Features

A master control system is moderately complex, involving a number of hardware components, software applications, documentation, computers, networks, and many options.

## Master Control Transition Processors

Master control transition processors are the heart of the master control system. There are 3 broad categories:

- Imagestore 750s—channel branding processors.
- MCPMs—master control processing modules.
- MCEs—master control engines.

Each Imagestore 750, MCPM or MCE is considered a channel. The main output of a channel is called “program output.”

Other outputs are preset output, clean-feed output, monitor output, and (for MCEs) aux output and preview output.

## Frames

MCPMs and MCEs reside in NV5100MC *frames*. The frames have 8 input card slots, 8 output card slots, and two control card slots. MCPMs and MCEs occupy output card slots.

Master control frames can also contain relatively small multi-format routers (MFRs).

A master control frame has an I/O backplane. Each input card and output card has a corresponding backplane module that provides 16 signal connections. MCPMs and MCEs also use backplane modules.

The backplane can receive inputs (1) from *local* devices such as VTRs and DVDs, (2) from routers controlled by an NV9000 system, or (3) from an MFR (multi-format router) in the master control frame, or a combination of all of these types of input.

## Panels

Master control operators use control panels to control channel processors. These devices all communicate on an Ethernet LAN. Both hardware control panels and software control panels (GUIs) are available.

MCPMs and MCEs can be controlled by an NVISION automation system. Imagestore 750s can be controlled by an Oxtel automation system.

Panels can control multiple channels.

## NV9000

A master control system can operate in the context of a NV9000 router control system. The routers in the NV9000 system supply inputs to the master control system.

The NV9000 control system communicates with the control card(s) in the NV5100MC frame. An NV9000 *must* be connected if the frame contains an MFR.

The NV9000 system provides 2 services important to master control: execution of salvos and routing of video and audio signals.

An NV9000 router control system is a requirement for a master control system that includes Imagestore 750s. The routers

provide the inputs to the Imagestore 750s and the sources that are controlled by the Imagestore 750s.

## MCEs and MCPMs

These transition processors receive source video and audio from the backplane of the NV5100MC frame or from a router, under NV9000 control, that is connected to the backplane.

These transition processors mix program input with upcoming input (called preset input) during a transition and impose video effects and audio overs on the output.

To some extent, video sources in use can be displayed on a monitor wall.

## Imagestore 750

Miranda’s Imagestore 750 is an independent transition processor, also called a “channel branding processor.”

Unlike MCEs and MCPMs, the Imagestore 750 does not reside in a frame, but occupies space (1RU) in a rack. In the context of the iMC master control system, the Imagestore 750 *does* require the presence of an NV9000 router control system.

The Imagestore 750 receives source video with embedded audio from a router in the NV9000 system through its A and B ports.

Imagestore 750s mix program input with upcoming input (called preset input) during a transition and impose video effects and voice-overs on the output. The video effects can be quite complex.

Sources in use by the Imagestore 750 can be displayed on a monitor wall. The monitors assigned to master control will display the set of sources most recently chosen at a control panel and will display the outputs of that imagestore 750.

## Intuition XG

Miranda’s Intuition XG processor and Xmedia software can be integrated with the master control system. Although Intuition XG can stand alone on its own merits, it can also be used as a master control subsystem. It includes a graphics processor that stores, and plays out, video keys (with audio). It can access “live” data including feeds from wire services and data bases.

The Intuition XG processor can deliver one or two keys simultaneously to an MCE. An Intuition XG key is processed by one of the MCE’s keyers. The Intuition XG processor can also control an MCE’s squeezeback, audio overs, and main source.

An Intuition XG processor can also be used to provide clips to an Imagestore 750. The clips are processed by one of the Imagestore 750’s DSKs (downstream keyers).

## Monitor Wall

Miranda's Kaleido-X multi-viewers can be used by the master control system. Control panel operators can cause a multi-viewer re-layout with a button press. A channel change can also trigger a multi-viewer re-layout.

Control panel operators can also select different groups of sources at any time. The monitor wall will display the currently selected group of sources.

For panels that control Imagestore 750s, a monitor wall can change to reflect a source group change.

## Other Components

### Emergency Bypass

All MCPMs and MCEs have an *emergency bypass* capability. This mechanism routes alternate programming to program output when the MCPM or MCE detects a critical problem. The product line includes an emergency bypass control panel (EBCP) that can be used to force an emergency switch.

The Imagestore 750s has a bypass mechanism also. If the Imagestore 750 loses power, its inputs connect to outputs directly and automatically and bypass internal processing.

### Tally Processor

The master control tally processor is third-party equipment. It senses and controls a certain set of master control events.

The tally processor can be configured to respond to master control events such as source or keyer presses and can be configured to trigger events such as source or keyer selections.

The tally processor also has 32 GPI inputs and 32 GPI outputs. These can be connected to master control GPIs and to other GPI devices in your facility.

### Device Controller

The master control "device controller" is also third-party equipment. It is a 1RU device that provides 4 serial ports for machine control under 3 selectable protocols (Sony, Odetics, and VDCP). It also has 32 optically isolated inputs and 32 optically isolated relay outputs. The outputs can be used in pairs for machine control. The odd-numbered outputs produce 100 ms 'start' pulses. The even-numbered outputs produce 100 ms 'stop' pulses.

## Configuration Software

Configuration applies to all hardware: control panels, to MCPMs and MCEs, Imagestore 750s, Intuition XG, tally processors, device controllers, and the NV9000.

NV9000 system configuration is far outside the scope of this guide. Other third-party equipment and certain Miranda products are also outside the scope of this guide.

All configuration requires a connected configuration PC. GUI configuration files require special handling. See the *Master Control Installation Guide*.

## Configuration Tools

The SB0243 CD includes 4 applications:

MasterConfig	Configures MCPMs and MCEs.
MasterDiag	Sets up MCPMs and MCEs. MasterDiag is also used for software uploads.
MasterLogo	Converts logo artwork to the internal format required by MCPMs and MCEs. (MasterLogo performs the upload of logos to the MCPM's or MCE's logo store.)
MCS Panel Configuration Editor	Configures master control panels for use with MCEs and MCPMs and with Imagestore 750s.

The following applications come with the Imagestore 750 and are distributed on the Media Conversion Software (MCS) CD:

1 Audio Builder	5 Animation Builder
2 Clip Builder	6 DVE Editor
3 Clock Builder	7 Imagestore 750 Configurator
4 Batch Converter	

The Intuition XG has configuration software (Xplay and Xstudio, for example) that belongs to an Xmedia software suite.

The tally processor's configuration application is built-in. Similarly, the device controller's configuration application is also built-in.

The Imagestore 750 also has a built-in browser-based configuration tool in addition to the Imagestore 750 Configurator.

We recommend that you read the configuration guides carefully. You need to read only the portions you want to understand.

## MasterConfig

MasterConfig is an application that configures MCEs and MCPMs. It has multiple configuration pages that let you configure main sources, video effects, audio overs, automation parameters, Intuition XG parameters, machine control and pre-roll details, and other matters.

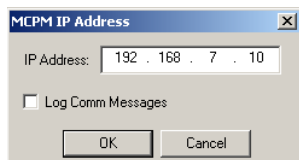
MasterConfig has a "general settings" page that, among other things, enables (or disables) options in the other configuration pages.

The different MCPM and MCE models have different characteristics, sometimes in subtle ways. Features available in one might not be available in others. All MCPMs and MCEs are independent, but the MCEs and MCPMs in a single frame share the inputs local to that frame.

## Choosing an MCE or MCPM

There is a list of MCPMs and MCEs at the left side of the MasterConfig window. (It might initially be empty.) Click to choose (or redefine, or delete) any entry in this list. (This list is actually shared by MasterConfig, MasterDiag, and MasterLogo.)

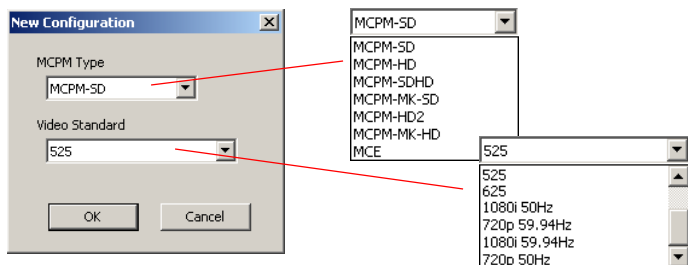
You can also enter the IP address of an MCPM or MCE directly at any time:



You can read a configuration from an existing MCE or MCPM, and you can write a configuration to an MCE or MCPM. However, it is not necessary to select an existing MCPM or MCE to create a configuration. You can create configurations “off-line.” After you create a configuration, you can associate it with any of the MCPMs or MCEs in the list.

## Starting a Configuration

A new configuration starts with a dialog asking what MCPM type you want to configure and for what video standard:



## Feature Support

MasterConfig supports the following prominent MCE and MCPM features (as well as numerous other lesser features):

### Source Buttons

It is in MasterConfig that you specify how a control panel’s main source buttons are used and how its audio over buttons are used.

### Router Sources

MasterConfig accepts 3 kinds of sources: (1) external router sources, (2) router pre-selection sources, and (3) locally connected sources.

Router pre-selection requires that at least one main source button (or audio over button) be “operator-modifiable.” When a source (or audio over) button is operator-modifiable, the panel operator can dynamically assign a source to that button from among hundreds, or even thousands, of NV9000 router sources.

An “external router source” is an NV9000 router source that is assigned to a button during configuration. Selecting an

external router source require nothing of the operator or of a control panel. However, external router sources are limited in number.

Locally connected sources are those connected directly to the backplane of the NV5100MC frame in which the MCE or MCPM under configuration resides.

## Automation

MasterConfig presents a few minor automation options. The term “system modifiable” applies to source buttons (and audio over buttons) that can be controlled by automation.

## MasterDiag

MasterDiag is a relatively small utility program, but nonetheless important. With MasterDiag, you can do the following:

- Set the IP addresses of MCPMs and MCEs.
- Update MCPM and MCE firmware. There are two cases:
  - MCPMs. At times, you will be directed by tech support to update firmware in an MCPM. The firmware files are not directly available. You must obtain them from tech support.
  - MCEs. Use the file `MCESoftwarePackage.nvz` in the ‘setup’ subfolder of the master control installation folder. If it becomes necessary — as when you receive new firmware — you can load this firmware in an MCE. The single `.nvz` file is appropriate for all MCEs.
- Use the timing page to view timing characteristics of video and audio inputs of MCEs. You can use the timing page in conjunction with other tools, such as Xplay, to adjust the timing of a video source.
- Use the System Status page to set the time and date.

## MasterLogo

MasterLogo is a utility program that supports the use of logos in MCEs and MCPMs. Like MasterDiag, it is not strictly a configuration program. MasterLogo converts graphic files (.TIF, .BMP, .JPG, .TGA, .PNG, .GIF) to the internal form (10-bit YCrCb) required by master control.

Logos may be static or animated.

It is MasterLogo that executes the upload of logos to an MCPM or MCE when MasterConfig writes a configuration to the MCPM or MCE. (The upload is an option. Logo upload can take a long time and MCEs don’t generally need it beyond the first upload.)

There are constraints on logo usage that are described in the *Master Control Reference Manual*.

## MCS Panel Configuration Editor

The MCS Panel Configuration Editor (the “panel editor,” for short) configures all control panels, hardware and software.

Control panels can control MCEs and MCPMs, or Imagestore 750s.<sup>1</sup> Panel configurations have dual functionality: any configuration has a set of functions that apply to MCEs and MCPMs and another set of functions that apply to Imagestore 750s. The panel uses the function set appropriate to the transition processor it is controlling.

A panel configuration does the following:

- Defines what channels (MCPMs, MCEs, or Imagestore 750s) a master control operator can select.
- Selects the NV9000 source categories the operator can use (if an NV9000 system is present) for MCEs and MCPMs.
- Defines configurable button functions — one set for MCEs and MCPMs and another set for Imagestore 750s.

With the panel editor, you can, of course, save and re-open configuration files in your PC's file system. You can manage configuration files any way you'd like.

You can develop configuration files “off-line.” It is not actually necessary to select a panel unless you want to read (or write) its configuration.

You can start with a new “empty” configuration, use a default configuration, or use an existing configuration as the basis for a new one.

## Panel Characteristics

Master control panels have the following prominent characteristics:

### Button Rows

Control panels<sup>1</sup> have 4 button rows: program, preset, preview/user, and aux/user.



The program buttons include main sources, video effects, and audio- or voice-overs. These combine to form the channel's program output.

The preset buttons are just like the program buttons, and combine to form what will become the program output after the next transition.

The preview/user buttons differ for MCEs and Imagestore 750s. They are not used when the panel controls an MCPM. For Imagestore 750s, these buttons are simply customer-configurable buttons. For MCEs, these buttons are just like the program and preset buttons and provide a third “preview” output that does not interfere with programming.

The aux/user buttons also differ for MCEs and Imagestore 750s. They are not used when the panel controls an MCPM. For Imagestore 750s, aux buttons are the same sources that

1. With the exception of legacy control panels.

appear on the other button rows, but the aux buttons direct the source to an auxiliary device such as a waveform monitor. The user buttons here are just customer-configurable buttons.

For MCEs, the aux buttons are sources that can be directed to the MCE's aux output. The aux buttons also include “aux delegate” buttons that change the purpose of the aux source buttons.

### GPI

All hardware panels have 2 GPI inputs and 2 GPI outputs. A hardware control panel can control and sense MCPM and MCE GPIs as well as its own GPIs.

The GUIs (software control panels) do not have GPIs but they can control and sense MCPM and MCE GPIs.

Imagestore 750 GPIO is not directly controlled or sensed by master control panels. However, GPI macros can be triggered.

### Source Buttons

Usually there are more sources than the number of source buttons on a panel. For MCEs and MCPMs, the panels can have a “bank select” button that places different sources on the same set of buttons.

Panel configurations support *router pre-selection* (for MCEs and MCPMs). For certain buttons, a panel operator can dynamically assign any one of hundreds of router sources to the button.

Imagestore 750s support multiple source groups. The panel operator can select among different source groups. The sources of the current group appear on the source buttons.

### Automation

Control panels are not automated. However, all panels have a configurable button function that enables or disables automation temporarily.

### Configuration Files

Configuration files for GUIs are handled differently from configuration files for hardware control panels.

To take effect, a GUI's configuration file must be placed in the same folder as the GUI's executable file and must be named `cecp_gui.uicfg`.

For a hardware panel, however, you must write the configuration file to the panel from the panel editor. Use the ‘Write Config to Panel’ command from the ‘File’ menu.

You can also read GUI configuration files and hardware panel configuration files. Use the ‘File > Open’ command to read a GUI file. Use the ‘File > Read Config from File’ command to read a hardware panel's configuration.

### Choosing a Panel to Configure

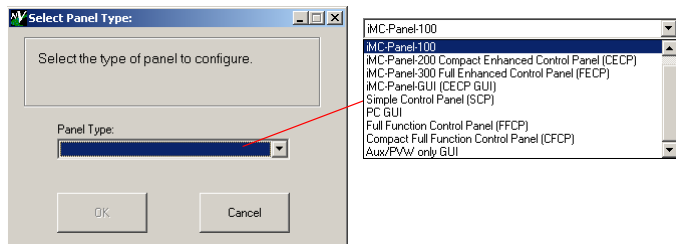
There is a panel list at the left side of the panel editor window. You can select (or define or delete) any entry in this list. If you

want to choose a panel, it must be in this list. If the list is empty, create a panel definition (name and IP address) by clicking the word 'Panels' at the top of the list.

It is not necessary to select an existing panel to create a panel configuration. You can create configurations "off-line." After you create a configuration, you can associate it with any of the panels in the list.

## Starting to Edit

A new configuration starts with a dialog asking what panel type you want to configure:



## Tally Processor

The master control tally processor is third-party equipment. Its configuration application is built-in and requires no separate installation. It communicates with a designated MCPM or MCE. It senses and controls a certain set of master control events.

Prior to configuration, you must have assigned the tally processor an IP address on the master control network. That assignment is made through the tally processor's front panel.

Once you have made that assignment, you can use any browser application (such as Internet Explorer) on your configuration PC to configure the tally processor. To access the configuration application, type the IP address of the tally processor in the URL field of the browser.



The tally processor's software presents 9 configuration categories. Seven of them are applicable:

Protocol assignment	GPI
Remote events	GPO
Combinational events	Event monitoring
System	

Each configuration sub-page manages a configuration table. The configuration tables can be saved and retrieved for fast setups and quick changes.

## Summary

The tally processor can be configured to respond to master control events such as source or keyer presses and can be configured to trigger events such as source or keyer selections.

The tally processor also has 32 GPI inputs and 32 GPI outputs. These can be connected to master control GPIs and to other GPI devices in your facility.

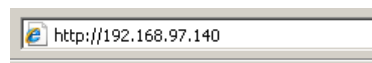
Read the *Tally Processor User's Guide* for further information.

## Device Controller

The master control device controller is also third-party equipment. Its configuration application is built-in and requires no separate installation. It receives machine control commands from an MCE over the master control network.

Prior to configuration, you must have assigned the device controller an IP address on the master control network. That assignment is made through the device controller's front panel.

Once you have made that assignment, you can use any browser application (such as Internet Explorer) on your configuration PC to configure the tally processor. To access the configuration application, type the IP address of the tally processor in the URL field of the browser.



The device controller's software presents 7 configuration categories. Five of them are applicable:

Protocol assignment	GPI
Event monitoring	GPO
System	

Each sub-page manages a configuration table. The configuration tables can be saved and retrieved for fast setups and quick changes.

You may ignore the 'Event Monitoring' table unless you want to trigger GP outputs based on certain inputs. ***This table is not used for master control.***

## Summary

The device controller issues machine control commands to various devices in the protocol (Sony, Odetics, VDCCP) appropriate to the device. It does so when an MCE configured for machine control or pre-roll sends it a machine control "command."

The device controller also has 32 GPI inputs and 32 GPI outputs. These can be connected to various devices in your facility. It is theoretically possible to use the GPOs for machine control.

Read the *Device Controller User's Guide* for further information.

## Imagestore 750

The configuration software for the Imagestore 750 is known as the Imagestore 750 Configurator.

The Imagestore 750 Configurator is fairly complex, having many configuration options. With the Imagestore 750 Configurator, you specify the parameters that govern its use in the iMC Master Control system.

It is in the Configurator that you specify which of the NV9000's sources the Imagestore 750 will use and the source groups that use those sources and which destinations connect to the Imagestore 750.

The most important aspect of the Imagestore 750 Configurator is its 'Audio Graph' tool that allows you to specify in detail the audio processing paths of the Imagestore 750.

The Imagestore 750 also has a built-in browser application with which you can do the following:

- Stop or restart the Imagestore 750.
- View system information
- Perform backups or software upgrades

The browser application has a front panel "mirror" that emulates the Imagestore 750's actual front panel.

Using the front panel or its "mirror," you can change Imagestore 750 settings dynamically. It is expected that you will use the front panel mirror to restart the Imagestore 750 after you save a modified configuration.

(The Imagestore 750 Configurator is available on a CD shipped with the Imagestore 750. It is **not** included in the shipment that includes this guide.)

## Other Software

NV9000-SE Utilities, UniConfig, MRC (Miranda Router Configurator) and CRSC (Compact Router System Configurator) are tools one or more of which will probably be required for configuring your system. Contact Miranda if you need to obtain that software.

The Tally Processor's configuration application is self-contained. The Device Controller's configuration application is also self-contained.

The Intuition XG software is extensive. Some of it is configuration software, some of it is image management software, and some of it is creative software. Some of it is loaded in the Intuition XG processor. Contact Miranda to obtain the software (and documentation) that you need.

The Imagestore 750 configuration software is available and necessary if your system includes an Imagestore 750. *You'll need the version that supports Imagestore 750 in the combined master control system.* That version is **1.5b4** at present.

## Software Installation

The software and documentation CD (SB0243) includes MasterConfig, MasterDiag, MasterLogo, and the MCS Panel Configuration Editor. The iMC-Panel-GUI is included on the SB0244 CD. No other software is included in the shipment that includes this guide).

### Preliminary Steps

Obtain and set up a Windows PC (XP, Vista, or Windows 7) to be used for configuration. If you intend to use a software control panel (GUI), obtain and set up a Windows PC for the GUI. It can be the same PC.

The PC(s) you use must be connected on the master control network.

If your master control system is part of an NV9000 control system, you are advised to enter the IP addresses of the NV9000 controller(s) — stand-alone or primary and secondary — during installation.

You might need to pre-configure the NV9000 system controller(s) to change the IP addresses of their master control ports.

One or more of your configuration PCs should be connected on the NV9000's house network.

The NV9000 router software and documentation CD is SB0033. It contains the NV9000-SE Utilities installer and the UniConfig installer. Both are requirements for configuring an NV9000 router control system. MRC (not on the SB0033 CD) is required for configuring an NV8500 family hybrid router.

## Installing Configuration Applications

Follow these steps to install master control configuration software on the configuration PC:

- 1 Insert the Software and Documentation CD (SB0243) in your CD drive. The following window should appear:



Click 'Installer'.



- If you already have master control software installed, you will see an add/remove message screen:



Click 'OK' and go to the Windows "control panel." Choose 'Add or Remove Programs'. Select and delete 'Miranda Master Control Configuration Software'. Then return to the installer and proceed.

- The Welcome screen displays:



Click 'Next' to proceed. Follow the simple instructions on each screen until the installation has completed.

When the installation has completed, it will have created a master control folder, with entries in the Windows Start menu. The Start menu path is:

Start > Programs > Miranda > Master Control > ...

These are the default pathnames of the four configuration programs:

```
C:\Program Files\Miranda\Master Control\bin\MasterConfig.exe
C:\Program Files\Miranda\Master Control\bin\MasterDiag.exe
C:\Program Files\Miranda\Master Control\bin\MasterLogo.exe
C:\Program Files\Miranda\Master Control\bin\MCSPanelConfig.exe
```

We recommend that you create shortcuts on your PC's desktop. To launch any of the applications, (1) choose the application from the Start menu, (2) double-click the application in its folder, or (3) double-click its desktop shortcut.

You may make copies of the installation files (as a folder) and any other files (including documentation) in your file system. (To do so, open the CD as a folder and browse.)

## Installing the GUI

Ensure that your PC is running Windows XP Professional, Windows Vista, or Windows 7.

For optimal GUI performance, your PC should have a video card capable of 1280×1024 (or better) resolution. The GUI is optimized for a touchscreen, but you can use a conventional monitor, keyboard, and mouse if you want.

- ▲ The GUI will not run properly until you have connected your PC on the master control network.

If you have purchased the Master Control GUI, follow these steps to install the GUI software:

- Insert the GUI CD (SB0244) in your CD drive. The following window should appear:



Click 'Installer'.

- If you already have the GUI software installed, you will see an add/remove message screen:



Click 'OK' and go to the Windows "control panel." Choose 'Add or Remove Programs'. Select and delete 'NVI-SION Master Control GUI SW'.

Then return to the installer and proceed.

- The Welcome screen displays:



Click 'Next' to proceed. Follow the simple instructions on each screen until the installation has completed.

When the installation is complete, it will have placed the GUI software in the master control folder, with an entry in the Windows Start menu.

The Start menu path is:

Start > Programs > Miranda > Master Control >  
Master Control iMC-Panel-GUI

The default pathname is:

C:\Program Files\Miranda\Master Control\bin\cecp\_gui.exe

We recommend that you create a shortcut on your PC's desktop.

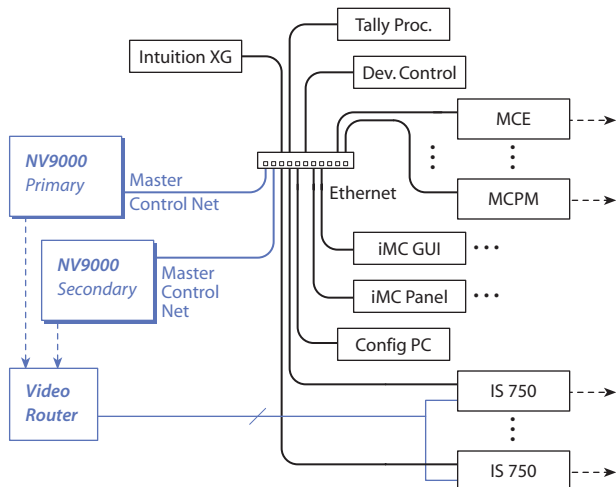
To launch the GUI, (1) choose the application from the Start menu, (2) double-click the application in its folder, or (3) double-click its desktop shortcut.

## Creating a Master Control Network

The master control network connects MCPMs, MCEs, master control panels, Imagestore 750s, and (optionally) configuration PCs, tally processors, device controllers, and so on. If you are using an NV9000 control system, it is also connected on the master control network. Notably, a master control frame is *not* on the master control network, although it might be on a router network.

To create the master control network, connect your master control devices to an Ethernet switch using Ethernet cable.

This sketch illustrates the connections:



Before you connect your devices, you must give them an IP address so that they are present on the same subnet, for instance 192.178.7.xxx. The method varies with the device:

- For MCPMs or MCEs, use MasterDiag to assign their IP addresses (through their diagnostic ports).
- For Imagestore 750s, assign an IP address at the front panel. Refer to Miranda's Imagestore 750 documentation.
- For hardware control panels, assign their IP addresses using their menu system.
- For software control panels (GUIs) and master control configuration PCs, ensure that the PCs have IP addresses on the master control network.
- For Intuition XG processors, login on the processor to change its IP address.
- For Tally Processors and Device Controllers, set the IP address at the front panel.

- For NV9000 system controllers, login in the controller and set the IP address of the master control network using Windows' Network Properties window.

In all these cases, the device is powered up and running without being connected to the Ethernet switch.

All devices on the master control network must have unique IP addresses.

- ▲ **Important:** All MCPM and MCEs ship with the same default IP address. All control panels ship with the same default IP address. If you have purchased more than one MCPM or MCE or more than one control panel, do not connect them all to the Ethernet switch until you have configured unique IP addresses for all devices.

## Running MasterDiag

Before you can place an MCPM or MCE on the master control network, you must assign it an IP address with MasterDiag.

### MCPM Setup

Follow these steps:

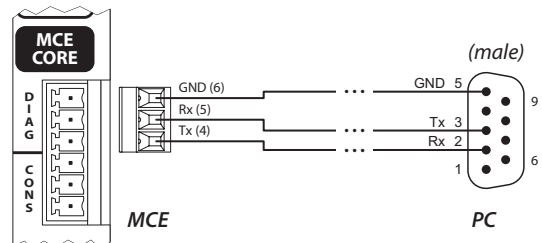
- 1 Connect a normal *straight-through* serial cable from a COM port of your PC to the diagnostic port at the front of the MCPM. The diagnostic port is a female DE9.
  - ▲ You might need a USB to DE9 adapter for newer PCs.
- 2 Launch MasterDiag. Choose serial mode from the 'Communications' menu. Choose the COM port at this time if necessary.
- 3 Choose the 'Ethernet Settings' tab. Click the "Read" button first. Then enter the IP address and subnet mask (255.255.255.0) for the MCPM. Click the 'Write' button.
- 4 You can disconnect the serial cable at this point, because you can use Ethernet communication through the master control network for all further modifications.
- 5 Repeat these steps for all MCPMs you want to be in your master control network.

### MCE Setup

The task is the same as for MCPMs, but the cable is different. If you have not done so, obtain or fabricate a DE9-to-Phoenix cable.

Then, follow these steps:

- 1 Connect the DE9-to-Phoenix cable from a COM port of your PC to the diagnostic port of the MCE. The diagnostic port is the upper 3 pins of the 6-pin Phoenix connector.



- 2 Launch MasterDiag. Choose serial mode from the ‘Communications’ menu. Choose the COM port at this time if necessary.
- 3 Choose the ‘Ethernet Settings’ tab. Click the ‘Read’ button first. Then enter the IP address and subnet mask (255.255.255.0) for the MCE. Click the ‘Write’ button.  
You can disconnect the serial cable at this point, because you can use Ethernet communication through the master control network for all further modifications.
- 4 Repeat these steps for all other MCEs you want in your master control network.

## Making MCPM and MCE Connections

The various MCPM and MCE backplane modules are all somewhat different. MCEs in particular use 1.0/2.3 Din connectors for video and audio signals. Other MCPMs use BNC connectors.

▲ DIN-to-BNC conversion panels (1RU) are available.

Here, you will make video reference, Ethernet, and possibly automation connections. Other connections that you can make later include audio monitor, GPI, emergency bypass, and Dolby metadata.

### Ethernet

Use a CAT5 Ethernet cable to connect each MCPM and MCE to an Ethernet switch that supports the master control network. You will have previously used MasterDiag to assign each MCPM and MCE an IP address on that network.

### Video Reference

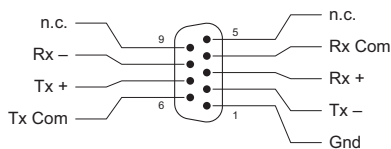
Connections differ for MCPMs and MCEs.

Connect an MCPM’s video reference (BNC) to a suitable video reference signal. An MCPM’s reference can be daisy-chained to other reference inputs. Terminate the reference chain with a 75Ω terminator.

Connect an MCE’s video reference (BNC) to a suitable video reference signal. An MCE’s reference is internally terminated and cannot be daisy-chained to other reference inputs. If you have multiple MCEs, use a DA or similar device to send a reference signal to each MCE.

### Automation

Each MCPM and MCE has an automation port (DE9, RS-422, female):



This guide does not address automation. But if you are planning master control automation, this is where to make the

connection. Use a serial cable suitable for your automation system.

## Hardware Control Panels

Power up your hardware control panels. Each panel accepts two power sources for redundancy. Only one is required.

### Ethernet

First, enter the IP address, subnet address, and possibly a gateway address in the appropriate submenu of the panel’s menu system. For most panels, choose the ‘Panel’ button from the touchscreen, then choose ‘IP Setup’ from the resulting submenu and proceed. Some panels might have a “LAN 2” option. Use LAN 1 and ignore LAN 2.

▲ It is *not* necessary to restart the panel.

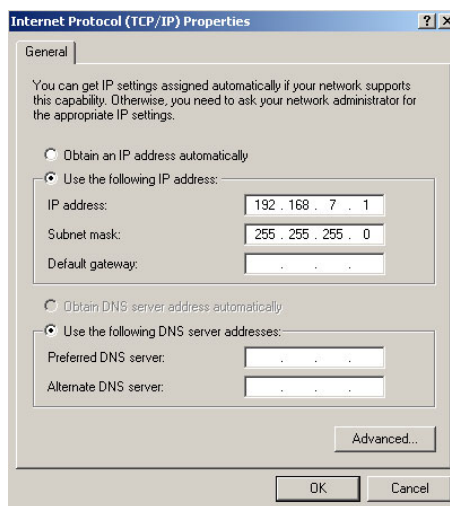
Then, using an Ethernet cable, connect the panel to the Ethernet switch of the master control network. Some panels have one Ethernet port; others have two. Use “LAN1” if a panel has two.

## GUIs and Configuration PCs

Windows users’ accounts must be set to ‘Standard User’ or better. Master control software does not function properly when users have ‘Restricted User’ access or less.

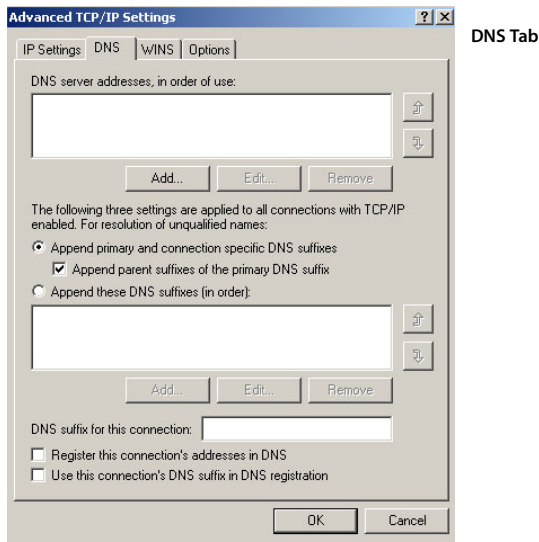
Your GUI PCs and configuration PCs must reside on the master control network. (Your PCs can belong to more than one Ethernet LAN.) Follow these steps to configure IP addresses on each PC.

- 1 Using the Windows Start menu on the Configuration PC, choose Settings > Network Connections > Local Area Connection.
- 2 Set the IP address and subnet as shown.



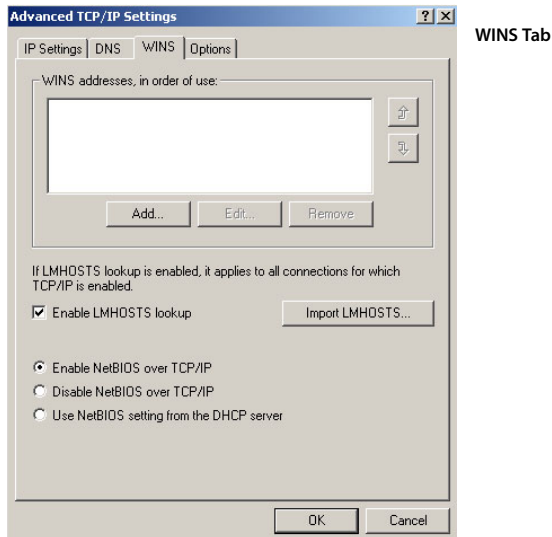
The subnet address should be 255.255.255.0.

- Click 'Advanced'. Choose the DNS tab and ensure the settings appear as shown here:



These values are the same for all PCs in the network.

- Choose the WINS tab and ensure the settings appear as shown here:



These values are the same for all PCs in the network.

- Other than the IP address, the settings are typical Windows® XP default selections.
- Important: DNS, WINS, or any other form of name resolution are **not** required and should **not** be enabled.

## Tally Processors and Device Controllers

The tally processor and the device controller are third-party devices.

First, connect the tally processor to the master control Ethernet switch. Use the front panel "menu" of the tally processor to define its IP address (which must be unique on the master control network).

Do the same for a device controller.

Configuration and wiring of the Tally Processor is well beyond the scope of this guide. Configuration and wiring of the Device Controller is also beyond the scope of this guide. Refer to the *Installation Guide*, the *Tally Processor User's Guide* and the *Device Controller User's Guide*. Also refer to the *Master Control Installation Guide*.

## Intuition XG

Connect the Intuition XG processor to the master control Ethernet switch. (It has only one Ethernet port.)

You may change the IP address of the Intuition XG processor using standard Windows tools. Refer also to Miranda's Intuition XG documentation.

You must also enter the IP address of the Intuition XG processor in the configuration of each MCE that uses it and in the configuration of each Imagestore 750 that uses it. See the *MasterConfig User's Guide* and the *Imagestore 750 Reference Manual* for details.

## Imagestore 750

Connect the Imagestore 750 processor to the master control Ethernet switch using either of its Ethernet ports.

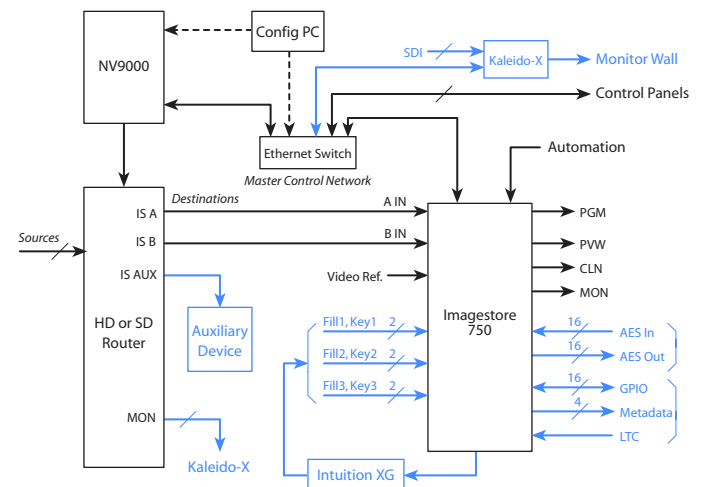
You can change the IP address of the Imagestore 750 using its front panel. Refer to the *Imagestore 750 Reference Manual* or to the *Master Control Installation Guide*.

## Making Imagestore 750 Connections

Installing the Imagestore 750 involves making cable connections and describing those connections in NV9000-SE Utilities, in the Imagestore 750 Configurator, and in various control panel configurations.

The connections for a system with a single Imagestore 750 differ from the connections for multiple Imagestore 750s because multiple Imagestore 750 can share a monitor wall and an auxiliary device.

These are the possible connections for a single Imagestore 750:



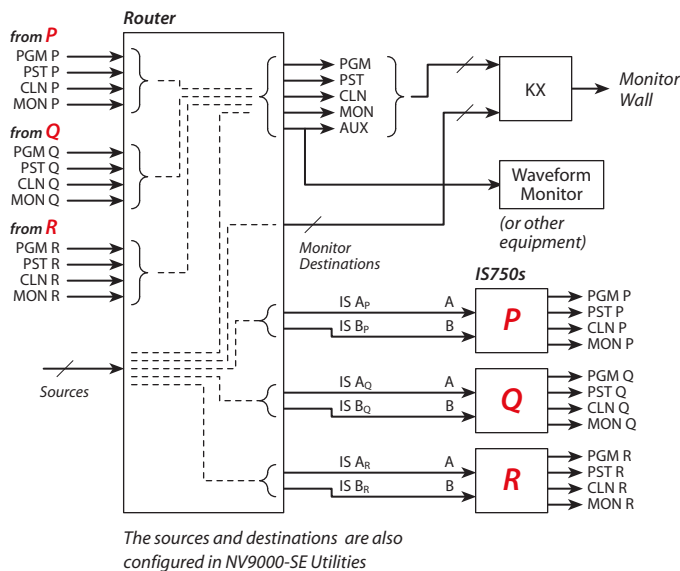
Your system might not need all these connections. The connections that are optional are indicated here in blue.

The NV9000 system controls a video router (such as an NV8256). The router provides the signals and the Imagestore 750 controls the NV9000. The Imagestore 750 receives commands from master control panels and relays those commands to the NV9000 whereupon the NV9000 switches sources to the destinations of interest.

Two of the router destinations must connect directly to the Imagestore 750. The other destinations related to the Imagestore 750 connect to other equipment.

## Multiple Imagestore 750s

The system for multiple Imagestore 750s feeds the outputs of the various Imagestore 750s back into the router and switches the output of the currently selected Imagestore 750s to a single set of destinations that feed a Kaleido-X monitor wall:



The basic connections for each Imagestore 750 are the same as for a single Imagestore 750. However, now it is possible to direct the sources and outputs of any one of the Imagestore 750s to the monitor wall.

- ▲ If an aux destination is defined for the monitor wall — in a panel configuration, that aux destination overrides any aux destination defined for an Imagestore 750 connected to the panel. If there is no aux destination defined in the panel configuration, no override takes place.)

All related router sources and destinations must first be defined in NV9000-SE Utilities. Then you must select router sources (and some destinations) in the Imagestore 750 Configurator. You must select certain router destinations (e.g., for the monitor wall) in the MCS Panel Configuration Editor.

## Connections and Configuration

Follow the instructions in the Master Control Installation Guide to make Imagestore 750 connections and to perform its initial configuration in the Imagestore 750 Configurator.

Refer to the *Imagestore 750 Reference Manual* for details.

## Misc. Topics

### Restarting an Imagestore 750

Go to the Imagestore 750 front panel or use the front panel mirror in the Imagestore 750's browser application.

The front panel has a hierarchically structured menu system that you operate using arrow buttons. Navigate using the arrow buttons to

Imagestore 750 > Setup > Soft Restart

or

Imagestore 750 > Setup > Hard Restart

and press the 'Enter' button. You might have to confirm that wish to restart.

### Restarting an Intuition XG

The Intuition XG runs Windows XP. To restart it, follow the usual Windows XP procedure. (You must login with a password.)

### Restarting an MCPM or MCE

MCPM and MCEs restart, or reset, after you (1) press the reset switch at the front of the module, (2) reinsert the module in the frame, or (3) cycle power to the module.

At reset, the MCE or MCPM enters bypass mode (wherein the emergency bypass relay routes bypass signals to the program output and inhibits MCE or MCPM output), the red bypass LED comes on, the red alarm LED comes on, and the MCE or MCPM initializes. After a few seconds, the heart beat LED comes on. Soon the red alarm light goes out, and the green LED (health) comes on and the amber light comes on (active). If the MCE or MCPM is functioning properly, the bypass light will have gone out.

Put simply: if the green LED turns on, the MCE or MCPM has restarted successfully. Otherwise, it remains in bypass mode. If it has reset properly, the MCE or MCPM configuration will have been copied from flash to RAM.

For MCPMs, any logos previously in RAM will have been lost, and must be reloaded from the configuration PC. For MCEs, logos are not lost because they remain in flash memory.

### MCPM and MCE Health

At the front of an MCPM or MCE, there is a green LED labeled "HEALTH" and a red LED labeled "ALARM." Any of the following conditions can cause the MCPM to be "unhealthy":

- 1 A problem with video reference (e.g., reference not present or video not locked).
- 2 The FPGAs are not loaded properly.
- 3 The application is missing or not loaded properly (e.g., an application for the MCPM-SD is loaded in the MCPM-MK-SD).
- 4 A problem with MCPM configuration (e.g., it is missing, corrupt, or of the wrong type for this type of MCPM).
- 5 A problem with AES clocks (received on the backplane from the control card or clock card).

## Restarting a Control Panel

A control panel restarts when you reconnect power or after you press 'Update Config' or 'Restart Panel' from the Panel Status submenu.

As the control panel restarts, the user-definable buttons display a cycling pattern and the LCD is kept off until the panel's main processor has booted. When the pattern stops cycling and the LCD lights up, the panel has reset. The LCD touchscreen will display a warning or error message (e.g., Panel Not Connected) if a problem exists.

The cyclic pattern displays the message "Master Control Panel Starting" on the upper row of user-definable buttons and turns the lower row of buttons red, one by one.

Put simply: when the red buttons go out and the menu lights up, the control panel has restarted successfully. You should check the messages on the menu.

## Panel Shutdown

Be careful not to cycle power until an control panel has shut-down completely.

## Control Panel Health

The control panel has alarm outputs (relays) which can be used to signal problems:

- Major alarm:
  - A failure of any circuit board.
  - Failure of both power supplies.
- Minor alarm:
  - Failure of one power supply.
  - Fan failure or over temperature.

## NV5100MC Details

### Frames

The master control frame is a metal enclosure that has the following functions:

- It holds MCPMs, MCEs, and I/O cards.
- It communicates with the NV9000 (if one is present).
- It provides a place to connect inputs and outputs and distributes those input signals to the outputs, MCPMs, and MCEs.

The frame is 8RU (14") and approximately 18.75" deep. Each has 8 input slots, and 8 slots for outputs, MCPMs, and MCEs. Each frame has 2 control card slots.

You can use a router control card (EM0374) or a simple clock card (EM0414) in either or both of the control card slots. A router control card is required if the frame hosts a router (an MFR). Use 2 control cards (or clock cards) for redundancy. If one fails, the other takes over.

Each frame has control system connectors (Ctrl1, Ctrl2, Diag) and AES reference, video reference, system alarm, and power supply alarm connectors. They also have connectors that are used when the frame is controlled by an SMS7000 system. The frame's time-code reference connector does not apply under master control, but might be used by the MFR.

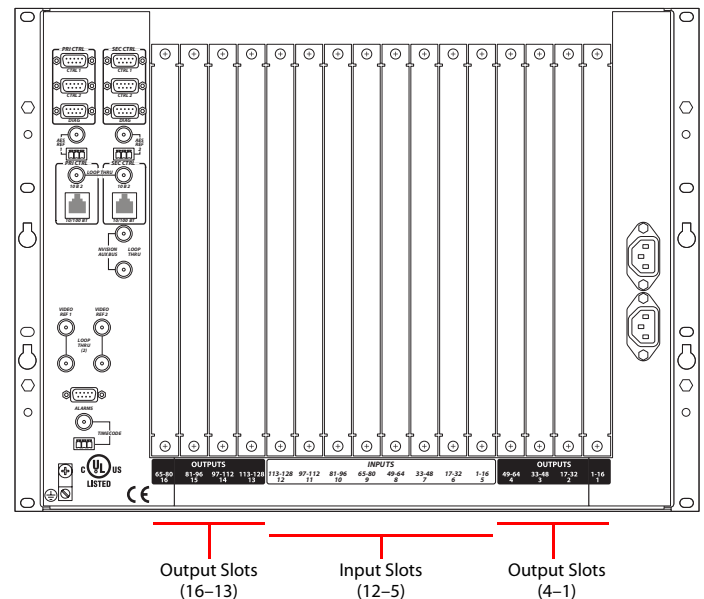
- ▲ An SMS7000 requires a mezzanine addition to the router control card.

Each frame has two power supply bays. One power supply is sufficient. Use two for power supply redundancy.

### Card Slots

Frames have 8 input slots and 8 output slots. The input slots occur in the middle of the frame. The output slots are divided into two groups of four. Each I/O slot handles 16 I/Os.

The numbering of the slots is sequential, from 1 to 16:



Be aware the connector numbers in slots 13–16 are in reverse order. For details regarding the connector numbers, see the *Master Control Reference Manual*.

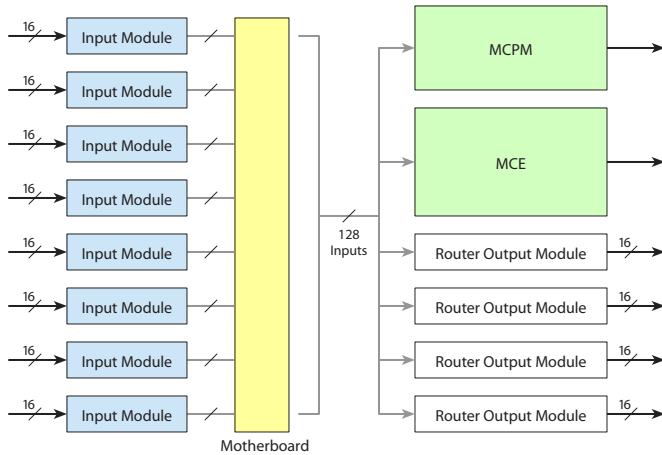
Some backplane modules use DB25 connectors, some use Phoenix 3-pin quick-release connectors, and some use BNCs. Each DB25 handles 8 signals (4 audio pairs).

MCPMs and MCEs have a variety of connector types, including coaxial (1.0/2.3 DIN), RJ-45, and D-type connectors. MCEs use DIN connectors for most signal connections.

A 16-signal DIN-to-BNC converter panel is available.

## Motherboard

The motherboard distributes the 128 input signals from the backplane to the router output cards (if any) and to the MCPMs and MCEs. This is a simplified block diagram of a typical master control frame:



Master control's input signal formats can be a mix of AES audio, analog audio, analog video, SD video, and HD video. The MFR can route time-code signals and machine-control signals, although the master control (MC) system does not recognize signals of these types. (MCEs do not accept analog audio or analog video input.)

All I/O modules, MCPMs, and MCEs, and their backplanes are "hot-swappable."

## Master Control Processors

All MCPMs and MCEs have common characteristics, such as audio meter/monitor outputs, general-purpose I/O, and emergency bypass capability. There are several different models. This is a summary:

MCPM-SD	SD video. 3 keyers, 2 logos, 1 squeezeback generator, 2 slots.
MCPM-HD, MCPM-HD2	HD video. 3 keyers, 2 logos, 1 squeezeback generator, 4 slots. Supports 2 wing output cards.
MCPM-SDHD	HD or SD video, field-programmable. 3 keyers, 2 logos, 1 enhanced squeezeback generator, 4 slots. Supports 1 wing output card.
MCPM-MK-SD	SD video. 3 keyers, 1 logo, no squeezeback, 1 slot. These modules are also called "mixer/keyers" or "branding engines."
MCPM-MK-HD	HD video. 3 keyers, 1 logo, no squeezeback, 2 slots. These modules are also named "mixer/keyers" or "branding engines."
MCE	HD or SD video, field-programmable. 3 keyers, 2 logos, squeezeback, 1-3 slots. The availability of features depend on the number of modules present.

## MCEs

MCEs are *modular*, comprising from 1 to 3 circuit boards and a number of optional daughter cards. There are 3 cards in the MCE card set:

- MCE-CORE. The minimum MCE comprises this single (full-size) card that performs *core* master control functions.
- MCE-PVW. The *preview* module supports the preview bus.
- MCE-AXM. The *audio expansion module* provides Dolby E decoders for the program, preset, and preview buses and presents Dolby E metadata and AES output at its backplane.

The following modules can be added to the cards of the MCE:

- MCE-DVE. The *digital video effect* cards are small mezzanine cards that can be added to the core and to the preview boards for video effects.
- Dolby E. Up to 8 third-party Dolby cards mount on the MCE-AXM board, depending on your needs.

MCEs have features that work in conjunction with the control panels. MCEs also work in conjunction with the (new) video and audio timing page of MasterDiag.

## Differences

Notable differences between the MCEs and MCPMs include:

- MCE audio and video connectors are coax (1.0/2.3 DIN) connectors; MCPM audio and video connectors are BNCs.
- MCEs have 16-channel audio. MCPMs have 8 channels.
- MCEs have 2 clean feed outputs; MCPMs have one.
- MCEs have 2 aux outputs and 2 (video) source inputs; MCPMs do not have these.
- MCE outputs (video or audio) carry 16 embedded audio channels. The MCE-AXM backplane provides 24 discrete AES outputs (12 pairs). Certain MCPMs offer analog audio monitoring output.
- MCEs have preview and aux buses. MCPMs do not.
- The diagnostic port (for MasterDiag) uses 3 pins of a 6-pin Phoenix connector. The diagnostic port of an MCPM is a DE9 connector.
- MCEs support machine control, pre-roll, and audio macros. MCPMs do not.
- MCEs can be integrated with an Intuition XG subsystems, and play out XG media clips. Intuition XG is not available for MCPMs.

There are other less important differences.

## Imagestore 750s

Imagestore 750s are independent 1RU devices not requiring a frame. They are essentially A/B switchers and require input from a video router controlled by an NV9000 system. The Imagestore 750 sends commands to the NV9000 based on commands it receives from a control panel.

Imagestore 750s have many different options, including two Dolby options, and a master control option. The master control option is essential for the Imagestore 750 to operate in the iMC Master Control system.

## Control Panels

There are 3 hardware control panels and 1 software control panel:

iMC-Panel-GUI	A software control panel, also called the "GUI." This panel also runs on a PC and has a graphical user interface. This GUI is a software emulation of the <i>iMC-Panel-200</i> . This GUI is designed to operate with (or without) a touch-sensitive screen.
iMC-Panel-100	A 3RU rack-mounted panel (just over 3" in depth) with a separate rack-mountable display. The display can be a touchscreen or an ordinary VGA monitor.
iMC-Panel-200	A compact hardware control panel that has a large LCD touchscreen, many function buttons, and a joystick. The iMC-Panel-200 mounts on a desktop or work surface. All buttons have LCD legends and color-coding.
iMC-Panel-300	A "full-size" control panel that has a large LCD touchscreen, many function buttons, and a joystick. The iMC-Panel-300 mounts on a desktop or work surface. All but 2 buttons have LCD legends and color-coding.

\* Other legacy panels exist.

In most cases, a panel's function buttons have dynamic legends and change color and brightness as required to indicate the function state.

The iMC-Panel-GUI is capable of executing on touch-screen PCs as well as traditional PCs (or laptop PCs).

## NV9000

A master control system can operate in the context of a NV9000 router control system.

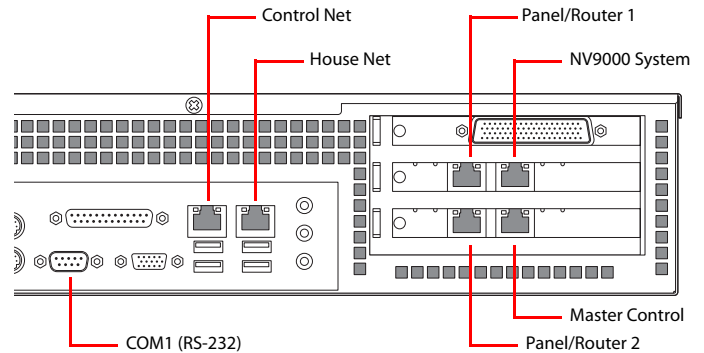
The NV9000 control system itself is *software* that receives commands from NV9000 control panel operators, sends them to the routers in the system, and forwards the status responses back to the control panel operators. The software executes on an NV9000 *system controller*, either in a stand-alone system or on one of the two system controllers in a redundant system.

The NV9000 can also receive commands from Imagestore 750s, and switch the router sources needed by a particular Imagestore 750.

Master control configurations reference the source devices, destination devices, and salvos defined in the NV9000 configuration.

The NV9000 system controller is a 2RU device that has multiple connectors at the rear.

This diagram identifies the default Ethernet ports:



There are stand-alone or redundant NV9000 systems. A redundant system includes a *primary* controller and a *secondary* controller. (A redundant pair is cross-connected on the control net. In addition, the COM1 ports of the two controllers must be connected.)

## NV9000-SE Utilities

NV9000-SE Utilities (SE, for short) is the software for configuring the NV9000 system itself. Portions of the NV9000 configuration must match the partition information set up for the MFR (if present) under UniConfig.

You (or someone in your organization) will use SE to define source and destination devices, device categories and indexes, level sets, and salvos, among other things. Important as these concepts are, they are outside the scope of this document.

Master control systems that communicate with an NV9000 system controller make use of source and destination IDs, device categories and indexes, and salvo IDs.

## MRC

MRC is the application created especially for configuring router partitions in NV8500 family hybrid routers controlled by the NV9000 system.

(Contact Miranda customer support to obtain MRC documentation.)

## UniConfig

UniConfig is the application for configuring router partitions either in the MFR in the master control frame or in external routers controlled by the NV9000 system.

(The Uniconfig installer is on the SB0033 software and documentation CD.)

## MFR

Skip this if you have no MFR in your NV5100MC frame or if you have no NV5100MC frame. If you have an MFR, you must also have a router control card (EM0374) in the frame.



Follow these steps to set up your router control card:

- 1 Connect a COM port of your configuration PC to the DE9 port at front of the router control card.
- 2 Launch UniConfig. Choose serial mode.
- 3 In UniConfig, set the IP address and subnet mask of the control card. The IP address you assign must be unique on the NV9000's panel/router network you have chosen to use for the MFR.

Remember to read the data from the control card first and then to write the new data to the control card.

- 4 In UniConfig, define the partitions and switchpoint settings of the MFR (if it is present).

Use UniConfig if you want to change the video reference between redundant and dual-reference modes. The option is useful only if your frame has two video reference signals.

Thereafter, it is possible to use UniConfig through the card's Ethernet port which is at the rear of the master control frame.

## Control Cards

An NV5100MC frame requires at least one control card. Control cards can be of two types:

- EM0374 router control card.
- EM0414 clock generator card.

The EM0374 is required only if you have an MFR in the frame. The frame has two control card slots. One of the slots for a redundant (or secondary) control card.

In all case, the control cards provide clocks and AES reference signals to the MCPMs.

The MFR (if present) receives commands from a router control system through the router control card.

MCPMs and MCEs specifically **do not** communicate through the control card. They are independent modules although they receive clocking from the control card and video and audio from the motherboard.

The EM0414 is just an AES clock generator card. It does not support a router in the frame.

The EM0414 has a number of switches and jumpers that you can set. The EM0374 also has a number of switches and jumpers that you can set. See the *Reference Manual* for details.

## I/O Cards

The master control system uses *input* cards. Its MCPMs and MCEs are its *output* modules. Some MCPMs (-HD, -HD2, and -SDHD) accommodate "wing output cards." A multi-format router (MFR) uses output cards and the wing output cards of MCPMs that have them.

These are the I/O modules that relate specifically to master control:

Analog Audio	Old SWB Video (input)
AES Audio	Old SWB Video (output) <sup>a</sup>
Analog Video	New SWB Video (input)
SD Video	New SWB Video (output) <sup>b</sup>

a. These SWB output cards fit in the wing slots of an MCPM-HD, -HD2, or -SDHD.

b. These newer output cards are for the MFR, if it is present in the frame.

## Power Supply

The frame can hold two PS6000 power supplies. The power supply senses the AC input voltage (90–130 or 180–250VAC, 50 or 60Hz) and adjusts itself to maintain a relatively constant DC output. You do not have to make a voltage selection. Each of its 48V outputs powers one of the five green LEDs and output test points on the front of the power supply.

*Connect the ground lug at the rear of the frame to earth ground using AWG 8–14 copper wire.*

## Other Topics

### Machine Control and Pre-Roll

MCEs can perform machine control and pre-roll operations. Control panels correspondingly can have several machine control and pre-roll button functions. Machine control and pre-roll functions are carried out by a third-party device controller on the master control network. Each device controller can control up to 4 VTRs (or similar devices) with a serial protocol (Sony, Odetics, or VDCP) and has the capability of controlling up to 16 other devices with start and stop pulses.

Any source can be assigned pre-roll and machine control characteristics.

Machine control and pre-roll functions are not available for Imagestore 750s.

### GPIO

MCPMs and MCEs have two GPI inputs and two GPI outputs (solid-state relay contacts). They are all optically isolated.

Hardware control panels also have two optically isolated GPI inputs and two GPI outputs (SPDT relay contacts). Software control panels (GUIs) do not have GPI connections.

Certain events can cause an MCPM's GPI output relay transition. An MCPM's GPI inputs, if enabled, control its emergency bypass relay. GPI inputs and outputs can be assigned to a panel button. The button color reflects the state of the GPI input or output.

## Reference

A master control frame's router control cards can receive video reference signals for the MFR (if one is present). Individual MCPM and MCEs need video reference also. The MCPMS and MCEs **do not** receive video reference through the frame's video reference connectors, but through their own.

The frame can also accept an AES reference for the MFR (if present) and for master control.

## Video Reference

MCE video reference must be NTSC or PAL only. MCE video reference is self-terminating. You will need a DA to supply video reference to multiple MCEs. MCPM video reference can be HD tri-level as well as NTSC or PAL.

## Audio Reference

You may supply a house reference signal to the frame and master control will use it. Otherwise, the control card (EM0374 or EM0414) generates a 48 kHz reference internally.

## Automation

Router automation uses the 'Ctrl' ports of the master control frame.

Master control automation uses the automation port (DE9) on the MCPM and MCE backplanes or one of the DE9 ports on the Imagestore 750. Router automation is independent of master control automation.

## Monitoring

MCPMs and MCEs provide a number of monitoring ports for video and audio. The various MCPMs differ in the way it is handled. See the *Master Control Reference Manual*.

An NV9000 system supports SNMP for an attached master control system. The master control agent is in the NV9000 system. The agent can be unlocked with the purchase of a license (part number EC9610).

The Imagestore 750 has an SNMP option, but the NV9000 does not use it.

## NV9000 Ports

If your master control system is part of an NV9000 control system, you must connect the master control port of the NV9000 system controller to the Ethernet switch of the master control network. (The NV9000 expects its master control port to be 192.168.7.201 or .202 but you can set up the master control network as you wish. Your master control net should not conflict with other NV9000 networks.)

The default IP addresses of the NV9000 controller's network ports are as follows:

Network	Primary IP Address	Secondary IP Address
Control net	172.16.1.1	172.16.1.2
Panel and Router Net 1	192.168.1.1	192.168.1.2
Panel and Router Net 2	192.168.2.1	192.168.2.2
NV9000 System Net	192.168.3.1	192.168.3.2
<b>Master Control Net</b>	<b>192.168.7.201</b>	<b>192.168.7.202</b>
House Net	192.168.20.1	192.168.20.2

Please refer to the NV9000-SE Utilities documentation.

## Contact Information

Contact Miranda if you need information about NVISION router control systems or third-party automation systems.



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In the Americas, call toll-free +1-800-224-7882 (9 am to 9 pm EST)

In Europe, the Middle East, African or the UK, call +44 (0) 1491 820222 (9 am to 6 pm, GMT)

In France, call +33 1 55 86 87 88 (9 am to 5 pm, GMT + 1)

In Asia, call +852-2539-6987 (9 am to 5 pm, GMT + 8)

In China, call +86-10-5873-1814

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