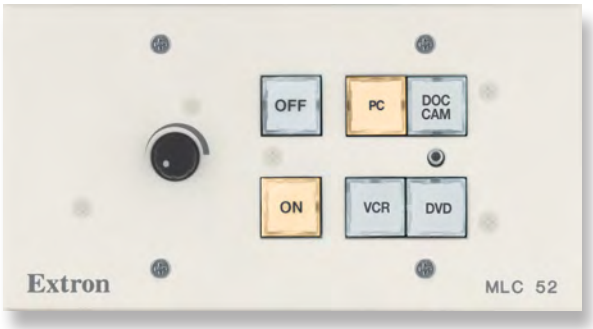
User Guide

MediaLink

MLC 52 Series

MediaLink® Controllers



Extron® Electronics
INTERFACING, SWITCHING AND CONTROL

68-1079-01 Rev. F
02 13

Safety Instructions

Safety Instructions • English

WARNING: This symbol, ⚠, when used on the product, is intended to alert the user of the presence of uninsulated dangerous voltage within the product's enclosure that may present a risk of electric shock.

ATTENTION: This symbol, ⚠, when used on the product, is intended to alert the user of important operating and maintenance (servicing) instructions in the literature provided with the equipment.

For information on safety guidelines, regulatory compliances, EMI/EMF compatibility, accessibility, and related topics, see the Extron Safety and Regulatory Compliance Guide, part number 68-290-01, on the Extron website, **www.extron.com**.

Instructions de sécurité • Français

AVERTISSEMENT: Ce pictogramme, ⚠, lorsqu'il est utilisé sur le produit, signale à l'utilisateur la présence à l'intérieur du boîtier du produit d'une tension électrique dangereuse susceptible de provoquer un choc électrique.

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Pour en savoir plus sur les règles de sécurité, la conformité à la réglementation, la compatibilité EMI/EMF, l'accessibilité, et autres sujets connexes, lisez les informations de sécurité et de conformité Extron, réf. 68-290-01, sur le site Extron, **www.extron.fr**.

Sicherheitsanweisungen • Deutsch

WARNUNG: Dieses Symbol ⚠ auf dem Produkt soll den Benutzer darauf aufmerksam machen, dass im Inneren des Gehäuses dieses Produktes gefährliche Spannungen herrschen, die nicht isoliert sind und die einen elektrischen Schlag verursachen können.

VORSICHT: Dieses Symbol ⚠ auf dem Produkt soll dem Benutzer in der im Lieferumfang enthaltenen Dokumentation besonders wichtige Hinweise zur Bedienung und Wartung (Instandhaltung) geben.

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Chinese Simplified（简体中文）

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注意：⚠产品上的这个标志意在提示用户设备随附的用户手册中有重要的操作和维护(维修) 说明。

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Chinese Traditional（繁　中文）

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注意 ⚠ 若　品上使用此符　，是　了提醒使用者。

有　安全性指　方　、法　遵守、EMI/EMF 相容性、存取　　和相　主　的　，　　Extron　站：**www.extron.com**，然後　　《Extron 安全性　法遵守手　》，　　68-290-01。

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Korean

경고: 이 기호 ⚠, 가 제품에 사용될 경우, 제품의 인클로저 내에 있는 접지되지 않은 위험한 전류로 인해 사용자가 감전될 위험이 있음을 경고합니다.

주의: 이 기호 ⚠, 가 제품에 사용될 경우, 장비와 함께 제공된 책자에 나와 있는 주요 운영 및 유지보수(정비) 지침을 경고합니다.

안전 가이드라인, 규제 준수, EMI/EMF 호환성, 접근성, 그리고 관련 항목에 대한 자세한 내용은 Extron 웹 사이트(**www.extron.com**)의 Extron 안전 및 규제 준수 안내서, 68-290-01 조항을 참조하십시오.

FCC Class A Notice

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. The Class A limits 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 interference; the user must correct the interference at his own expense.

NOTE: This unit was tested with shielded I/O cables on the peripheral devices. Shielded cables must be used to ensure compliance with FCC emissions limits.

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AAP, AFL (Accu-Rate Frame Lock), ADSP (Advanced Digital Sync Processing), AIS (Advanced Instruction Set), Auto-Image, CDRS (Class D Ripple Suppression), DDSP (Digital Display Sync Processing), DMI (Dynamic Motion Interpolation), Driver Configurator, DSP Configurator, DSVP (Digital Sync Validation Processing), FastBite, FOXBOX, IP Intercom HelpDesk, MAAP, MicroDigital, PowerCage, ProDSP, QS-FPC (QuickSwitch Front Panel Controller), Scope-Trigger, SIS, Simple Instruction Set, Skew-Free, SpeedMount, SpeedNav, SpeedSwitch, Triple-Action Switching, XTP, XTP Systems, XTRA, ZipCaddy, ZipClip

Conventions Used in this Guide

Notifications

The following notifications are used in this guide:

CAUTION: A caution indicates a situation that **may** result in minor injury.

ATTENTION: Attention indicates a situation that may damage or destroy the product or associated equipment.

NOTE: A note draws attention to important information.

Software Commands

Commands are written in the fonts shown here:

```
^AR Merge Scene,,Op1 scene 1,1 ^B 51 ^W^C
[Ø1] R ØØØ4 ØØ3ØØ ØØ4ØØ ØØ8ØØ ØØ6ØØ [Ø2] 35 [17] [Ø3]
```

Esc X1 * X17 * X20 * X23 * X21 CE ←

NOTE: For commands and examples of computer or device responses mentioned in this guide, the character "Ø" is used for the number zero and "O" is the capital letter "o."

Computer responses and directory paths that do not have variables are written in the font shown here:

```
Reply from 2Ø8.132.18Ø.48: bytes=32 times=2ms TTL=32
C:\Program Files\Extron
```

Variables are written in slanted form as shown here:

```
ping xxx.xxx.xxx.xxx –t
SOH R Data STX Command ETB ETX
```

Selectable items, such as menu names, menu options, buttons, tabs, and field names are written in the font shown here:

From the **File** menu, select **New**.

Click the **OK** button.

Specifications Availability

Product specifications are available on the Extron website, **www.extron.com**.

Contents

Introduction

This section gives an overview of the *MLC 52 User Guide* and describes the Extron® MLC 52 Series MediaLink® Controllers and their features. Topics include:

About this Guide

This guide contains detailed information and best practice recommendations about cabling, programming, and configuring the MLC 52 Series MediaLink Controllers and provides specifications and dimensions.

Throughout this guide the MLC 52 controllers are referred to as "MLC 52," "MLC," "MLC series," or "controller."

About the MLC 52 Series MediaLink Controllers

The MLC 52 Series enable RS-232 or infrared (IR) remote control of a projector or other display device. They are economical, compact (one-gang or two-gang size), easy-to-use controllers for use with audio/video equipment in sites such as elementary or high school classrooms or small conference rooms. The MLC 52 acts as a universal remote control panel, providing control of the power, input selection, volume, and other functions of a display device. Device control is provided via the MLC front panel buttons or via a host computer or control system using RS-232 communication and the Extron Simple Instruction Set (SIS™) commands or the Extron MLC 52/DVCM 50 Configuration Program.

The MLC 52 can be configured using three different methods:

- IR learning
- IR data transfer ("beaming") from another MLC 52
- Using Extron device control drivers with the MLC 52 configuration software program

Models

US models

- **MLC 52 IR** — One-gang size. Controls the display device by IR.
- **MLC 52 IR VC** — Two-gang size. Controls the display device via IR. This model has a volume control knob to control an amplifier such as the Extron MPA Mini Power Amplifier (purchased separately).
- **MLC 52 RS** — One-gang size. Controls the display device by either IR or RS-232.
- **MLC 52 RS VC** — Two-gang size. Controls the display device by either IR or RS-232. This model has a volume control knob to control an amplifier such as an Extron MPA Mini Power Amplifier (purchased separately).

European models

- **MLC 52 RS EU** — European two-gang size. Controls the display device by either IR or RS-232.
- **MLC 52 RS EU VC** — European two-gang size. Controls the display device by either IR or RS-232. This model has a volume control knob to control an amplifier such as an Extron MPA Mini Power Amplifier (purchased separately).

MK models

- **MLC 52 RS MK** — UK one-gang size. Controls the display device by either IR or RS-232.
- **MLC 52 RS MK VC** — UK two-gang size. Controls the display device by either IR or RS-232. This model has a volume control knob to control an amplifier such as an Extron MPA Mini Power Amplifier (purchased separately).

The cabling, operation, and setup are identical for all MLC 52 models. All have the same button functionality.

Standard Features

- **IR and RS-232 ports for universal display device control** — The MLC 52 has a dedicated port for communicating with virtually any projector or display via infrared signal. The MLC 52 RS models also have ports for unidirectional RS-232 wired serial control. Projector control drivers can be downloaded from **www.extron.com** or can be created using the MLC 52 configuration program.
- **Discrete On and Off display device power controls** — These controls simplify system operations and eliminate the need for a handheld display or projector remote control.
- **Configurable, backlit buttons** — The front panel buttons can be set up to control display device power, volume, input selection, or any other IR or RS-232 command function supported by the device. The buttons are backlit and can be custom labeled, offering easy operation in low-light environments.
- **Macro and toggle button modes** — Each button on the MLC can be programmed to send out up to four IR or serial commands. You can set each button to issue all its commands with one press (macro mode) or to issue its commands one at a time, in sequence, with each button press (toggle mode).
- **Front panel configuration port** — This RS-232 serial port enables advanced configuration, driver downloads, and firmware updates to be performed from the front panel without the need to remove the controller from its mounting. The optional Extron configuration cable (part number **70-335-01**) can be used to connect the MLC 52 to the RS-232 port of the computer.
- **Three configuration methods** — The MLC 52 can be configured easily using the following methods:
  - **IR learning** — Allows the MLC 52 to be set up directly from the remote control of the display device without the need for software.
  - **IR data transfer** — Duplicates complete configuration information from one MLC 52 model to another without cables or software.
  - **Configuration software** — Combined with one of the many IR or RS-232 drivers that are provided with the controller on DVD or available on the Extron website, the Extron MLC 52 Configuration Program provides fast and simple setup.

- **Inactivity timer for display shutoff** — Adjustable timer control provides automatic shutdown of the display device to conserve energy, prevent plasma burn-in, and extend projector lamp life.
- **Front panel security lockout** — Front panel lockout (executive mode) can be implemented where the MLC 52 is installed in an unsecured environment and universal access is not desirable.
- **Flexible mounting options** — With a standard electrical box or one of the included mounting brackets ("mud rings"), the MLC 52 can be mounted in a variety of locations, including walls and lecterns.
- **Volume control (VC) faceplates** — The two-gang sized VC models each have an integrated volume control knob in addition to the six control buttons. To use this knob, connect the MLC 52 to a power amplifier (purchased separately), such as the Extron MPA Series Mini Power Amplifier that is also connected to the projector or display (see the **application diagrams** on page 4). The volume control knob adjusts the volume on the amplifier.

  This option frees the two volume control buttons on the MLC to be used or reconfigured for other display device functions. On these models, the two buttons normally used for volume control on the standard MLC 52 models can be programmed to control additional outputs or other projector or display functions.
- **Section 508 Compliant** — The MLC 52 meets or exceeds accessibility standards for Electronic Information Technology. For more information about the Extron Commitment to Accessibility, see the Accessibility at Extron web page at **www.extron.com/company/article.aspx?id=accessibility**.
- **Power supply** — A 12 V, 1 A, external universal ENERGY STAR® qualified power supply, part number **70-775-01**, is included and provides worldwide compatibility, low power consumption, and reduced operating costs.

  NOTE: The Extron PS 124 and other Extron power supplies can also be used with the MLC 52.

Options and Accessories

- **MPA Series Mini Power Amplifier** — Connect an MPA 152 (part number **60-844-01**) to the volume control port of the MLC 52 VC models, and to your projector or display and speakers. This enables you to use the MLC volume knob to control the volume of the speakers via the MPA.
- **Remote control** — The optional IRL 20 signal repeater provides infrared remote control of the MLC unit from up to 30 feet (9.1 m) away. The signal repeater works with any Extron hand-held IR remote control.

MLC 52 Configuration Software

The included MLC 52/DVCM 50 Configuration Program is used to configure the MLC buttons and ports via an RS-232 connection. This software, provided on a DVD that is delivered with the product, enables you to set functions for the front panel buttons and to configure the MLC ports in order to control devices via the MLC. The software works in combination with the IR or RS-232 drivers, also provided with the MLC on DVD or at **www.extron.com** (see **Installing the Software from the DVD** on page 48 to access this program).

Device Drivers

In order for the MLC 52 to control a switcher, projector, or other display device via IR or RS-232 communication, it must have drivers loaded for the devices it will control. Drivers can be obtained in the following ways:

- IR or an RS-232 driver files can be installed from a disc, downloaded at **www.extron.com**, or downloaded from Extron via the driver subscription feature within the MLC 52 configuration program.

  The drivers are saved on your computer in a folder located at `C:\Program Files` **or** `Program Files (x86)\Extron\Driver2`. You can then upload the desired drivers to the MLC via the MLC 52 configuration software.

- IR commands can be captured from the IR remote control of a device through IR Learning or IR data transfer to create a driver. When a driver is created, it can be added to the configuration program so that the commands can be used to configure the MLC to control the device (see **Configuring the MLC 52 Using IR** on page 15).

System Requirements

The minimum PC system requirements for installing the configuration software are:

- Intel® Pentium® III 750 MHz processor
- Microsoft® Windows® XP or higher
- Microsoft.NET Framework 2.0 or higher
- 128 MB of RAM
- 50 MB of available hard disk space

Application Diagrams

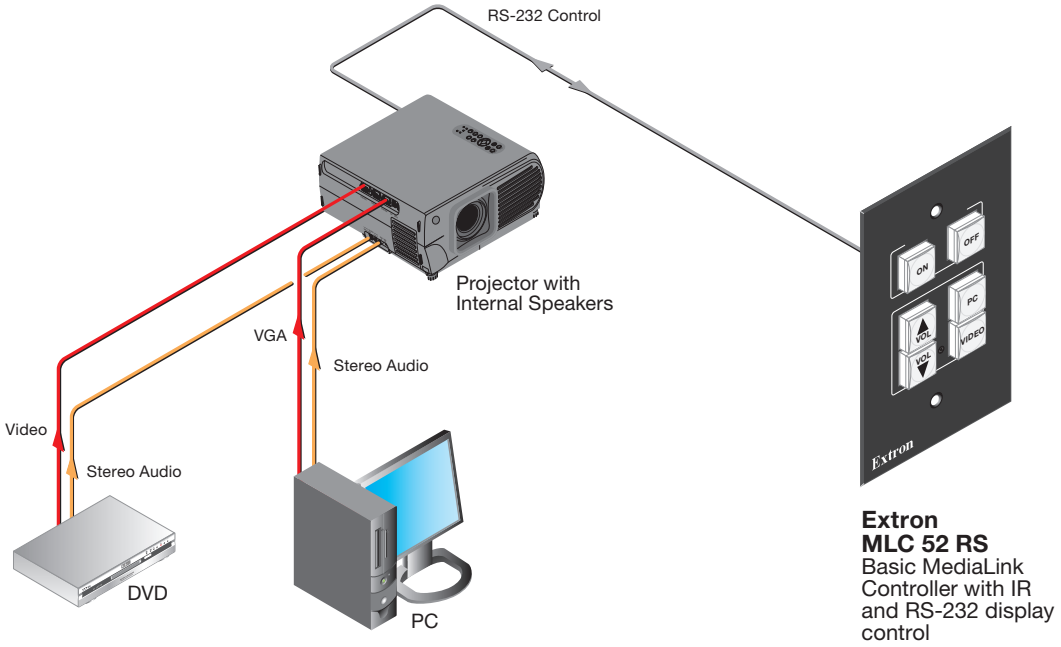


Figure 1. Application Diagram for an MLC 52 RS

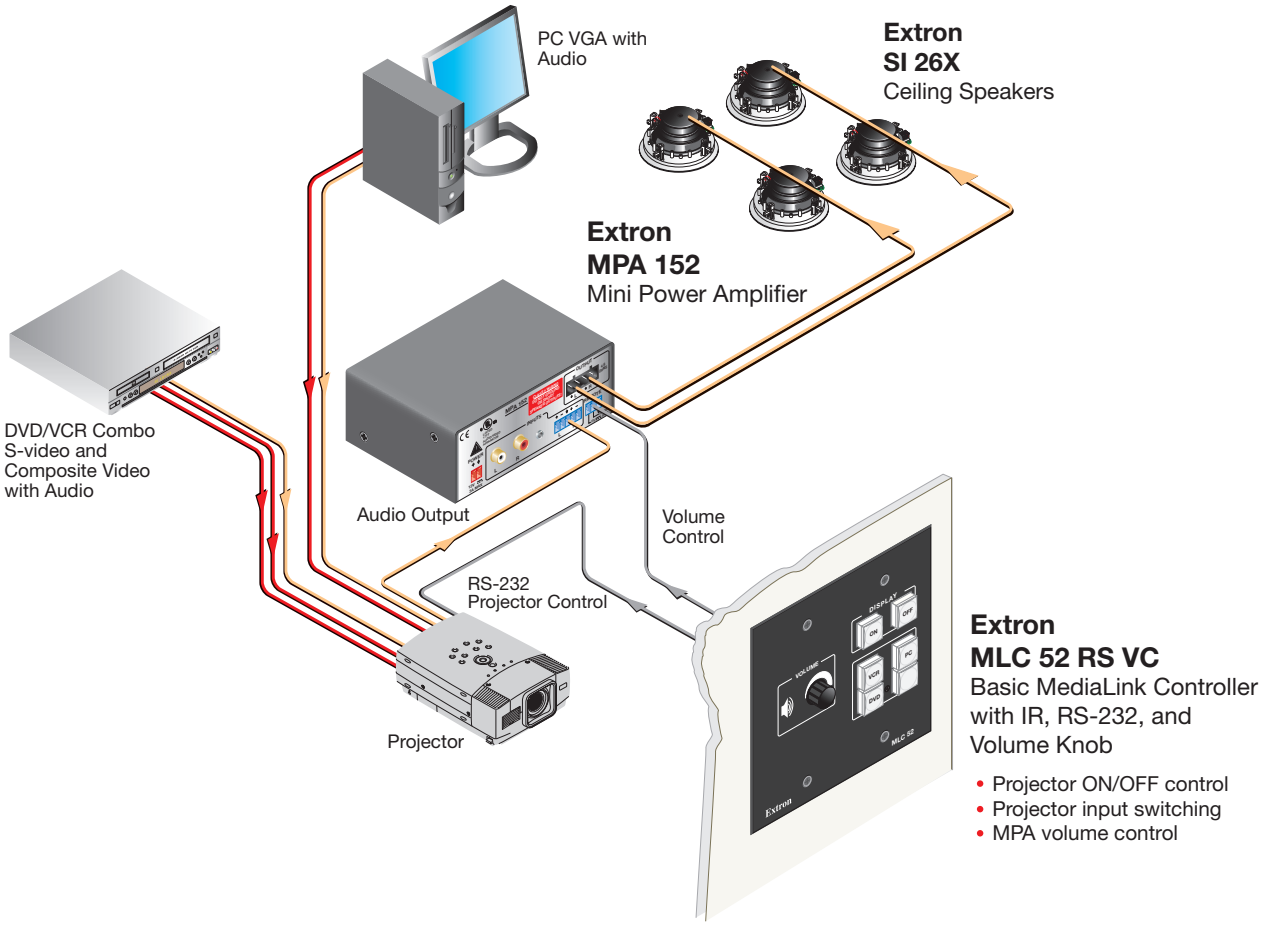


Figure 2. Application Diagram for an MLC 52 RS VC

Installation and Configuration

This section describes the front, side, and rear panel features of the four MLC 52 models, and provides procedures for installing and configuring the controllers. Topics include:

- **Rear Panel and Cable Connections**
- **Installation Steps**
- **Replacing the Faceplate (US Models Only)**
- **Replacing Button Labels**
- **Wiring the Control Connector**
- **Configuring the MLC 52 Using IR**
- **Setting Up an MLC 52 VC Model with an Extron Amplifier**
- **Mounting the MLC 52**

Rear Panel and Cable Connections

The following diagrams show the locations of the connector, switches, LEDs, and IR sensors on the back of the MLC 52 with standard and VC faceplates.

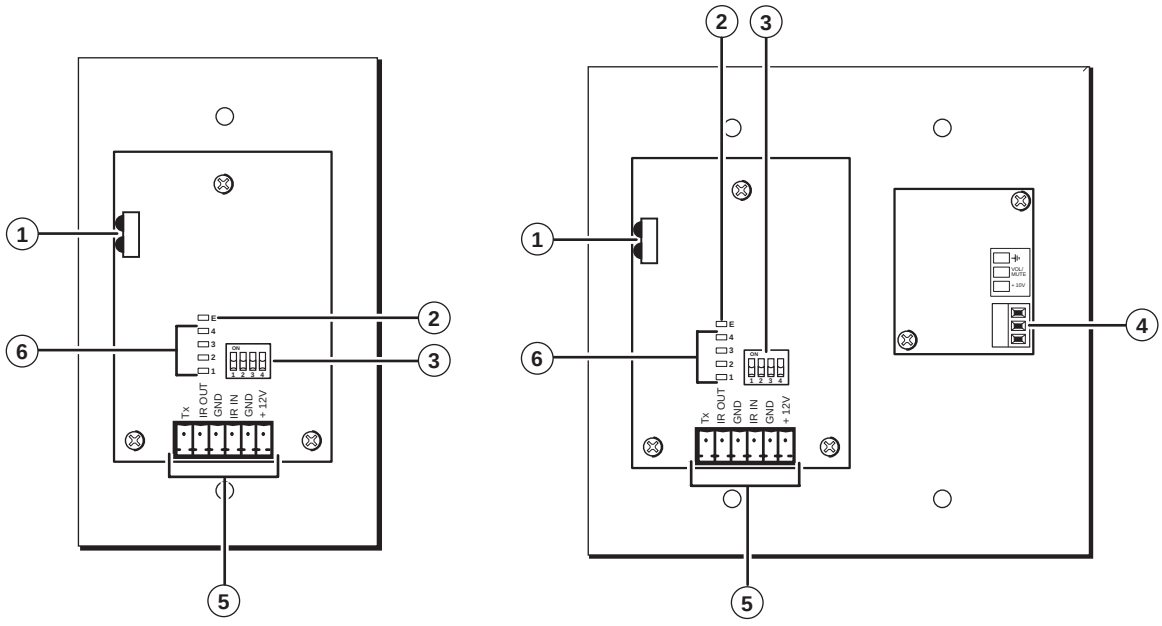
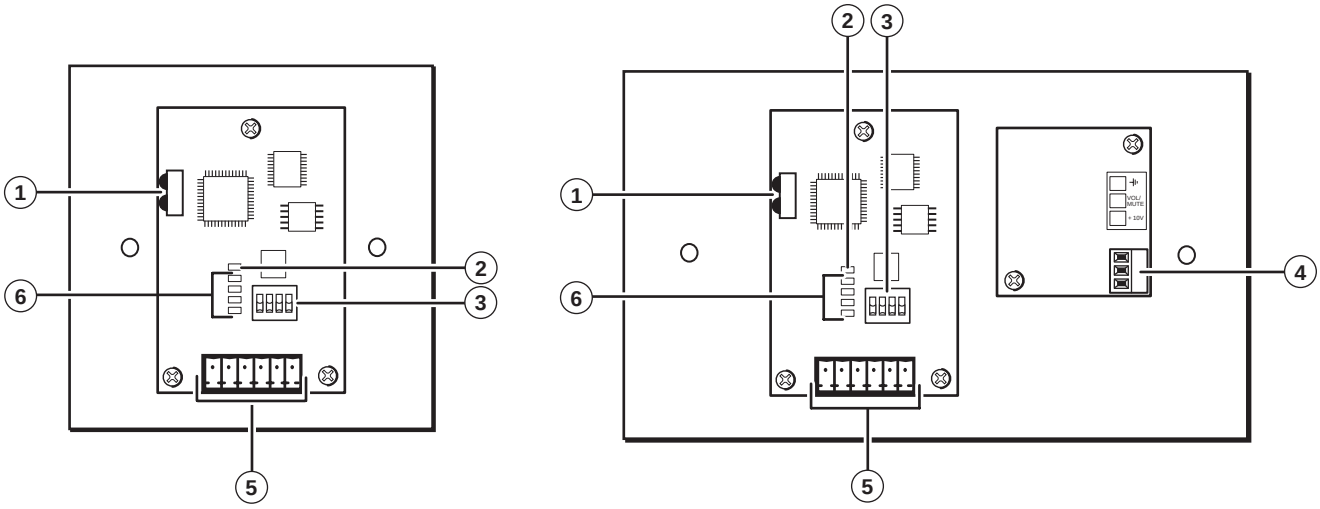
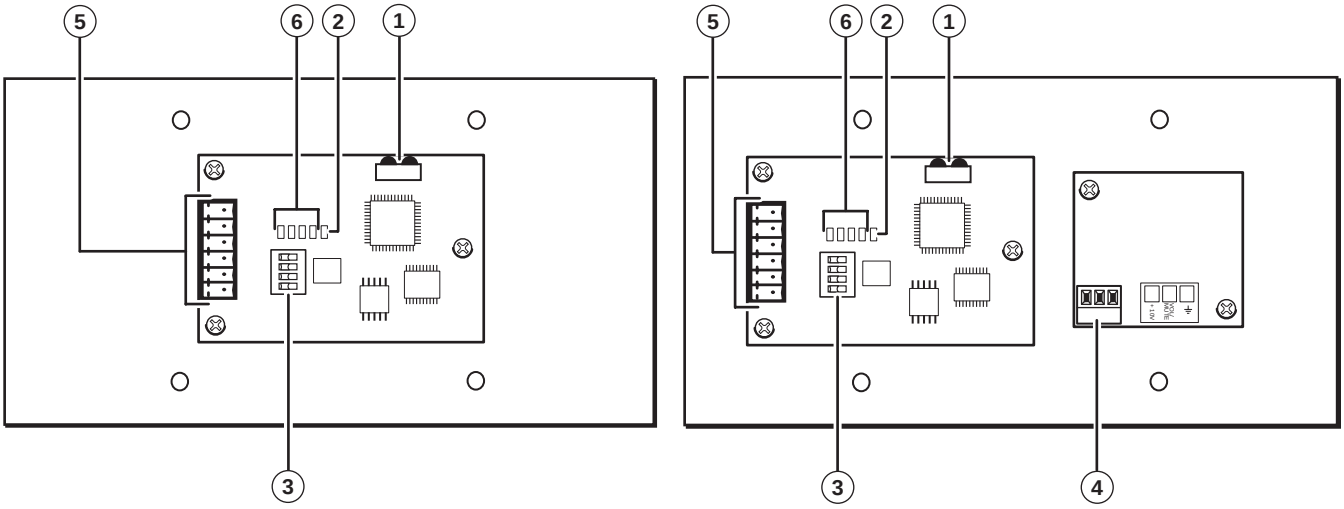


Figure 3. MLC 52 and MLC 52 VC Rear Views (US Models)



MLC 52 RS MK **MLC 52 RS MK VC**

Figure 4. MLC 52 RS MK and MLC 52 RS MK VC Rear Views



MLC 52 RS EU **MLC 52 RS EU VC**

Figure 5. MLC 52 RS EU and MLC 52 RS EU VC Rear Views

① **IR Learner/Transmitter** — These sensors allow for IR control of the MLC and for IR Learning. The two LEDs (one for transmitting, one for receiving) send and receive IR signals, enabling the MLC to learn commands and clone configurations from another MLC 52. The IR remote control of the display device must be pointed directly at these LEDs for best results.

The MLC can "learn" IR commands in order to control the display device. IR Learning of device control codes is necessary only if there are no RS-232 codes available for that device or if you need to customize the driver (see **Configuring Using IR Learning** on page 18 for the IR Learning procedure).

You can also perform IR learning via the MLC 52 configuration software (see the MLC 52 Configuration Program help file for the procedure).

② **Enable Macro LED** — The LED located immediately above or to the right of the four green IR LEDs is labeled E, for Enable Macro. This LED lights amber when you place a button in macro mode (see **Setting Up Button Macros Using IR** on page 20).

③ **Configuration switches** — When set to On, these DIP switches place the MLC in IR learning or data transfer mode, or disable IR repeats.

- **Switch 1:** Enables IR learning.
- **Switch 2:** Enables data transfer, such as cloning the current MLC configuration onto another MLC 52 (see **Configuring Using IR Data Transfer (IR Beaming)** on page 15).
- **Switch 3:** Disables IR repeats during playback. For most applications, this switch is placed in the off position.

Switch 4 is not used.

④ **Volume control (VC models only) connector** — Connect an amplifier such as the Extron MPA 152 or a PoleVault switcher to this direct-insertion captive screw connector to enable the volume control knob on the MLC 52 VC front panel to raise and lower the volume on the display device via the amplifier or switcher.

NOTE: This port must be connected only to an Extron device such as a PoleVault® PVS switcher, an MP Series microphone-to-line preamplifier, or an MPA Series audio amplifier.

⑤ **Display control and power connector** — This shared six-pole, 3.5 mm captive screw connector is used for IR and RS-232 control of the display device and for DC power (see **Wiring the Control Connector** on page 12 for information on how to connect supported devices to the MLC).

NOTE: The RS-232 projector control port is present on this connector but not functional on the IR models. The port is functional only on the RS models.

⑥ **IR Learning indicators** — Each button on the MLC front panel has four memory blocks, which can be programmed with up to four IR (or RS-232) commands. The IR Learning indicator LEDs provide visual feedback indicating the following:

- Which of the four memory blocks contains a command
- Which of the four memory blocks is ready to be programmed or configured
- The IR learning status of the controller

See **Configuring Using IR Learning** on page 18 for details.

Installation Steps

ATTENTION:

- Installation and service must be performed by authorized personnel only. UL listed electrical boxes are recommended.
- If using an electrical box, ensure that it is grounded properly.

To install and set up the MLC:

1. If applicable, prepare the installation site (see **Mounting the MLC 52** on page 23 and **Mounting an Electrical Box** on page 63; or see the instructions provided with the optional faceplate, mounting device, or electrical box).
2. Make and install button labels as desired (see **Replacing Button Labels** on page 10).

3. If you want to use a different faceplate from the one that is attached, remove the installed faceplate from the MLC, and replace it with the new one (see **Replacing the Faceplate [US Models Only]**).
4. Attach cables to the rear of the MLC and to the display device as well as any optional devices such as the MPA Mini Power Amplifier, IR emitters, and IRL 20.
5. Connect power cords and turn on all the devices, including the MLC.
6. Configure the controller using one of the following methods:
   - IR learning (see **Configuring Using IR Learning** on page 18)
   - IR data transfer (beaming) (see **Configuring Using IR Data Transfer (IR Beaming)** on page 15)
   - Configuration program (see **Using the MLC 52/DVCM 50 Configuration Program** on page 47 to start the program. See the configuration program help file for detailed information on using the software.)
7. Test the system: press the MLC buttons, watch the display, and listen to the audio output to determine whether the output devices are responding correctly (powering on and off, switching inputs, and so on).

   If the outputs are not responding, ensure that all devices are plugged in and receiving power. Check the cabling, and make adjustments as needed.
8. Mount the MLC to the wall or furniture.
   a. Disconnect the MLC power supply at the power source end (not at the MLC end).
   b. Disconnect power from the other devices.
   c. Secure the faceplate onto a UL-approved electrical wall box, a mounting bracket, a wall, or furniture (see **Mounting the MLC 52** on page 23).
   d. Restore power to the MLC and to the connected devices.

Replacing the Faceplate (US Models Only)

The MLC is delivered with a black plastic faceplate attached, and an additional one-gang plastic faceplate in white. You can replace the black faceplate with the white one or with a different one-gang sized faceplate of your own. You can also replace it with the MLM 52 VC two-gang metal faceplate with the volume control knob (part number **70-538-02** or **-03**), which is available in black or white. MLM 52 faceplate replacement kits can also be ordered (see **Optional Accessories** on page 62).

NOTE: See the *MLM 52 1GWP and MLM 52 VC User Guide* for further information on faceplates for the MLC 52.

To replace the faceplate:

1. Hold the MLC face down. Use a small Philips screwdriver to remove the three attachment screws (marked ① in **figure 6** on the next page) from the back of the MLC, and keep them to replace later.
2. Lift the MLC off the faceplate (see **figure 7** on the next page).
3. Place the MLC onto the new faceplate, aligning the MLC buttons with the openings in the new faceplate and the three screw holes with the faceplate standoffs.
4. Replace the three screws removed in step **1** and tighten them.

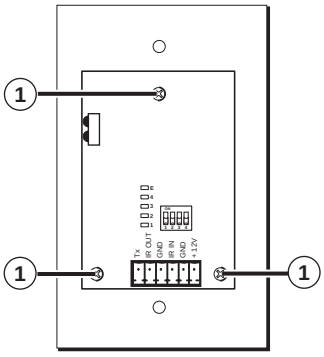


Figure 6. Screws to Remove from the MLC Faceplate

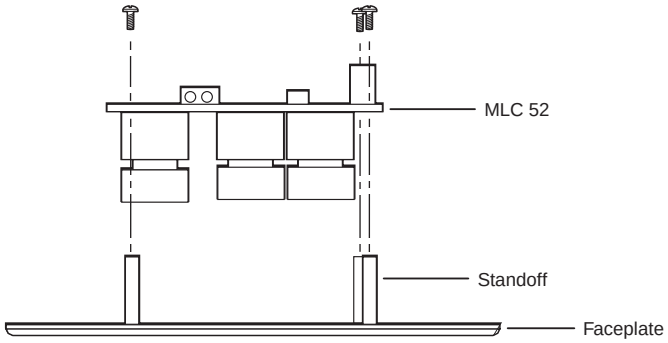


Figure 7. Installing the MLC onto a New Faceplate

Replacing Button Labels

The button caps are prelabeled for your convenience. However, you can replace the labels with others that are included with the MLC, as follows:

1. The button assembly consists of a clear lens cap, the button label, and a white diffuser (see **figure 9** on the next page). Remove the button assembly by inserting a small, flat-bladed screwdriver between the base and the diffuser of the button to gently pry the button assembly away from the base, as shown in figure 8.

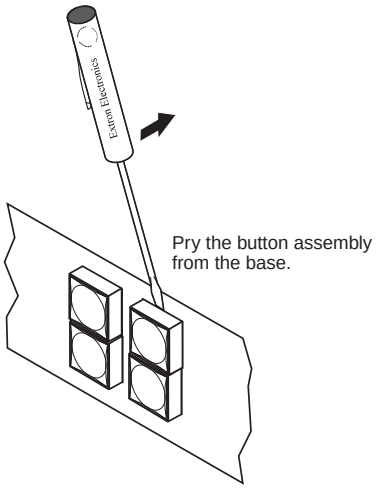


Figure 8. Pry the Button Button Assembly Off the Base

2. Locate the small corner notch on the lens cap, and slide the screwdriver between the lens cap and the diffuser (see ② in the illustration below).
3. Using a rotating motion of the screwdriver, carefully pry the two pieces apart (see ③ in figure 9).

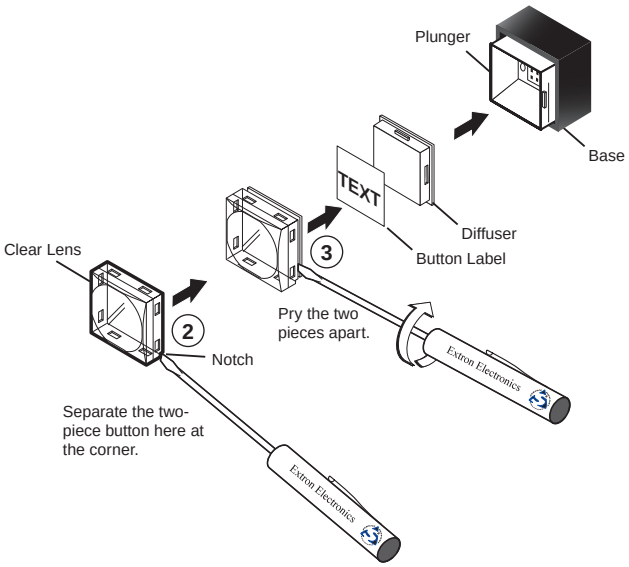


Figure 9. Removing and Replacing a Button Label

4. Lift out the transparent square label that you want to replace. You may need to use a small screwdriver to gently pry the label out.
5. Detach one of the preprinted labels or a blank one from the label sheets included with the MLC 52. Remove the label from the diffuser and, if applicable, peel the protective film from the front of the label.

> **NOTE:** If you want to create customized labels, you can use a label maker, such as the Brother® P-touch®, and clear label material to print text to place on the blank labels. Cut the labels so that they are square and measure ½ inch on each edge.

6. Insert the new label into the clear button cap, align the white diffuser with the cap, and firmly snap it into place.
7. Gently, but firmly, press the reassembled button into place on the MLC 52 front panel.
8. Repeat steps **1** through **7** as needed to relabel other buttons.

Wiring the Control Connector

The display and source control connector allows you to connect cables for IR devices, RS-232 devices (RS models only), and AC power to the MLC. The illustration below shows the MLC control connector pin assignments that are described on the following pages.

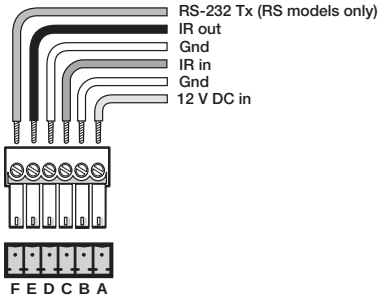


Figure 10. Pin Assignments for the MLC 52 Display and Source Control Connector

The ports in this connector, from left to right, perform the following functions:

- **F (Tx)** — Transmits the RS-232 signal for projector control.

  NOTE: Although this port is present on both the IR and the RS models, it is functional only on the RS models.

- **E (IR out)** — Used for connecting an IR emitter to issue IR commands. Up to two emitters can be wired to this port.
- **D (GND)** — Ground for IR or RS-232 projector control
- **C (IR in)** — Used for connecting an optional IRL 20, so that an IR remote control can control the MLC.
- **B (GND)** — Ground for the +12 VDC power
- **A (+12 V)** — Power input for the product (12 VDC)

NOTE: The two-gang MLC 52 IR VC and MLC 52 RS VC have the same control ports as the one-gang models.

Wiring for RS-232 Control (RS Models Only)

The MLC 52 RS and the MLC 52 RS VC send out RS-232 commands via the Tx port (pin F) for controlling a display device.

If you have an RS model and want to control the device via RS-232, connect a cable between the device and this 3.5 mm, 6-pole direct insertion captive screw connector.

Wiring varies depending on the device model. In most cases, only the transmit (Tx) and ground connections are needed.

- Connect the transmit wire to the F pin.
- Connect the ground wire to the D pin.

(See **figure 11** on the next page.)

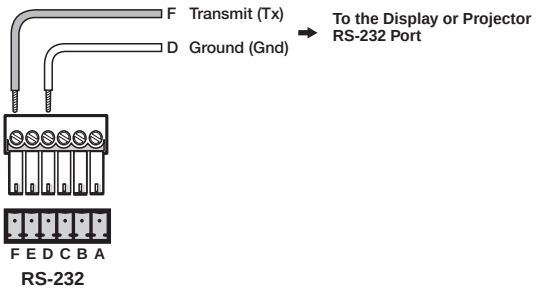


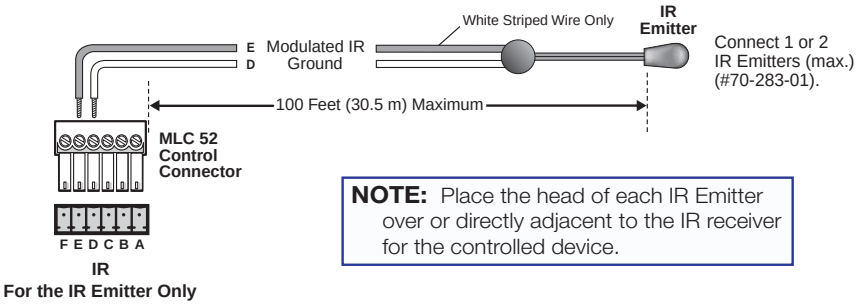
Figure 11. Wiring for RS-232 Control (RS Models Only)

Extron recommends using the CTL Series Comm-Link Control System Cable, available in lengths of 500 feet (150 m) (non-plenum only) and 1000 feet (300 m) (plenum and non-plenum) for this connection (see **Recommended Cables** on page 62 for ordering information).

Guides for connecting and controlling specific models of display devices are available on the Extron website. See the display device user guide for the device pin assignments in order to determine which of the cables wires to connect to the MLC RS-232 pins.

Wiring for IR Control

To control display or input devices via IR commands from the MLC, you can connect Extron IR emitters to the IR Out pin of the control connector. Up to two IR emitters can be connected via this connector at one time. Wire the connector as shown in the following illustrations.



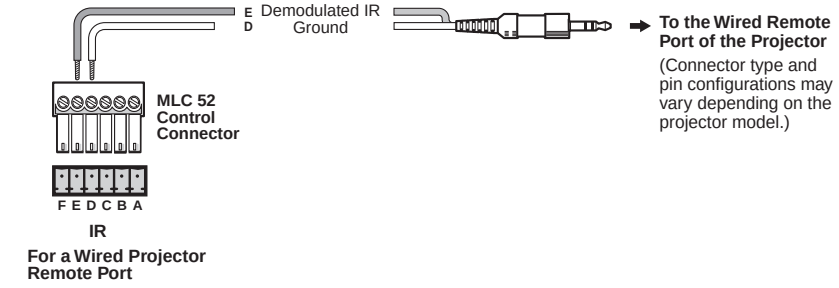


Figure 12. Wiring the Control Connector for IR

Wiring an IRL 20

The Extron IRL 20 is a hard wired IR signal receiver that can be used with the MLC 52 and an IR remote control. The IRL 20 receives a signal via its front panel (or an IR sensor) from the IR remote control, and outputs a modulated IR signal via an IR emitter.

Wire and connect the IRL 20 to the MLC 52 as follows:

1. If it has not been done, cut the required length of Extron CTL (Comm-Link) cable to connect the MLC 52 to the IRL 20 (see **Recommended Cables** on page 62 for cable part numbers).

   The maximum total distance between an Extron controller and the IRL 20 is 150 feet (45.7 m).

2. Attach a 3.5 mm, 5-pole captive screw connector to the end of the cable that will be plugged into the IRL 20.

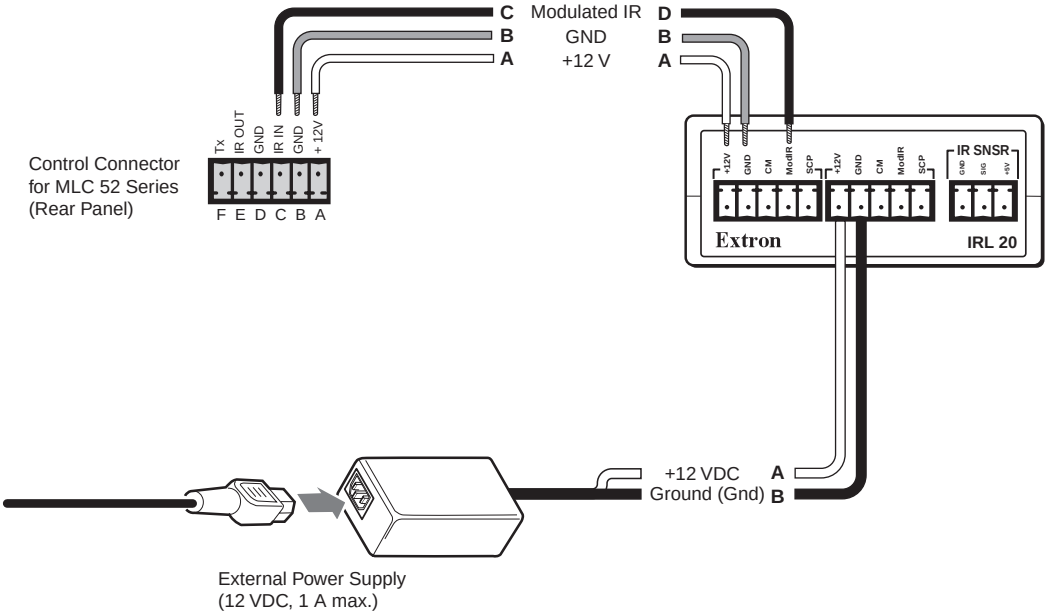


Figure 13. Wiring an IRL 20

3. Connect the wires on the other end of the cable to the provided 3.5 mm 6-pole captive screw connector.
   - A (MLC) to A (IRL 20)
   - B (MLC) to B (IRL 20)
   - C (MLC) to D (IRL 20)

   NOTE: Do not connect more than one IRL 20 (either in parallel or in series) to an Extron device.

4. Plug the 5-pole connector end of the cable into one of the IRL 20 communications connectors.
5. Plug the 6-pole connector end of the cable into the control port on the MLC 52 back panel.
6. Connect power to the MLC or the IRL 20.

   NOTE: The +12 VDC power is shared between the MLC 52 and the IRL 20 when they are connected. You can wire the power supply to either the MLC or the IRL 20.

Wiring the Power Connector

The control connector also contains a power connector for the MLC 52. Connect the supplied external 12 VDC, 1 A power supply to this port to power the MLC as shown in the following diagram.

NOTE: The Extron PS 1210 (included) and other Extron power supplies can be used with the MLC 52.

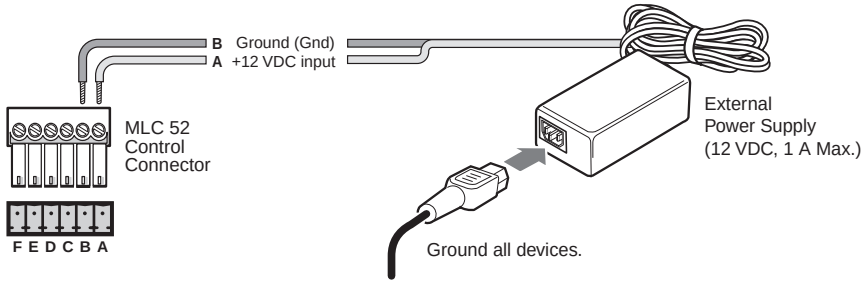


Figure 14. Connecting the MLC 52 to the External Power Supply

NOTE: Check the polarity of the power supply before connecting it to the MLC.

ATTENTION:

- Always use a power supply provided by or specified by Extron. Use of an unauthorized power supply voids all regulatory compliance certification and may cause damage to the supply and the MLC.
- The power supply must be located within the same vicinity as the Extron AV processing equipment in an ordinary location, Pollution Degree 2, secured to the equipment rack within the dedicated closet, podium, or desk.
- The installation must always be in accordance with the applicable provisions of National Electrical Code ANSI/NFPA 70, article 75 and the Canadian Electrical Code part 1, section 16. The power supply must not be permanently fixed to building structure or similar structure.

Configuring the MLC 52 Using IR

The MLC 52 can be programmed via IR by the following methods:

- IR data transfer from an MLC 52 that has been configured
- IR learning from your projector remote control

Configuring Using IR Data Transfer (IR Beaming)

You can configure your MLC 52 by transferring button configuration data to it from another configured MLC 52 via the two IR LEDs on the back panels of the MLCs. With this method, you replicate (clone) the other MLC configuration on your own unit without the use of software or cables.

The following transfers are allowed:

- From an RS model to another RS model
- From an IR model to another IR model
- From an IR model to an RS model

To transmit configuration data via IR, both the transferring and the receiving MLCs must be removed from the wall, electrical box, or furniture, and both must be powered on. The MLC that is already configured can be powered by an external power supply, or it can share a power supply with the unit that will be configured.

NOTE: All MLC 52 models use the same IR data transfer procedure.

1. On the MLC from which the configuration will be transferred (the donor unit), set **all** configuration switches to Off (down).

Transmitting MLC

2. On the MLC that will receive the data, set switch **2** to On (up) and all the other switches to Off (down).

Receiving MLC

3. Position the two units so that the IR Transmit and Receive LEDs of both MLCs are facing each other, and no more than 6 inches (15 cm) apart.

Data Transfer

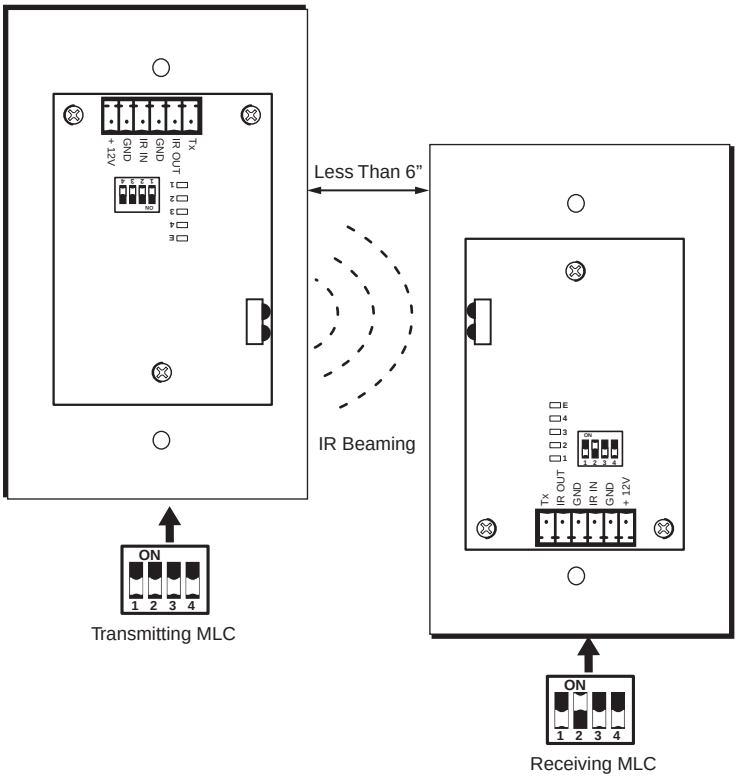


Figure 15. Setting Up Transmitting and Receiving Units for Wireless Data Transfer

The data transfer begins when the receiving unit detects the transmitting unit. The process takes 15 to 20 seconds to complete, though it may take longer if the transmitting unit has multiple commands programmed on each button.

The front panel buttons act as data transfer progress indicators. While data is being transferred, the buttons on both the transmitting and the receiving MLCs blink sequentially in clockwise order, starting with the On button in the upper-left corner (see figure 16). This cycle repeats until transfer is complete.

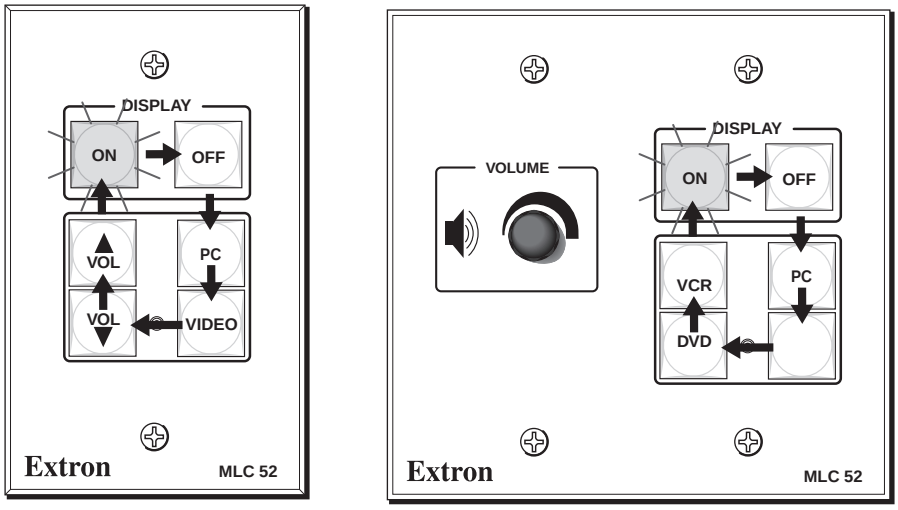


Figure 16. Order in which the Buttons Blink during Data Transfer

After approximately 17 percent of the data has been transferred, the On button lights and remains lit to maximum brightness. After another 17 percent has been transferred, the Off button lights to maximum brightness also and remains lit. After each increment of 17 percent of the data has been transferred, the next button in clockwise order lights brightly. When a button becomes permanently lit, the remaining buttons continue to blink in clockwise rotation, until the transfer process is complete and all buttons are remain steadily lit.

The following table shows how each percentage of transferred data is indicated by button lighting.

Percent Complete	MLC 52 Models Buttons Lit	MLC 52 VC Models Buttons Lit
Less than 17%	On	On
18% to 36%	Off	Off
37% to 54%	PC	PC
55% to 72	Video	(blank)
73% to 90%	Vol ▼	DVD
90% to 100%	Vol ▲	VCR

When the transfer is complete, all buttons on each unit remain brightly lit until a button is pressed on the unit.

NOTE: If the transmission is interrupted (for example, the two units become separated so that the IR LEDs are no longer in direct line of sight of each other) and the conditions necessary for transfer are subsequently restored, the two units restart the transfer process.

4. When the data transfer is complete, do either of the following:
   - If you want to repeat the transfer process to configure another MLC 52, repeat steps **2** and **3** for the unit that is to be configured. Press any button on the donor unit. The transfer process restarts.
   - If you are finished performing data transfers, return configuration switch 2 on the receiving MLC to the Off (down) position. Press any button on both units to return them to the state they were in before the transfer. All buttons dim except for those that were bright previously. Reinitialize the receiving unit by pressing any of its front panel buttons.

Configuring Using IR Learning

You can also configure the MLC 52 by using IR Learning, which does not require configuration software. By this method, you can program the functions that are on the remote control for your display device onto the MLC front panel buttons. This procedure must be performed before the MLC is mounted on a wall or furniture, so that the IR Transmit/Receive LEDs are accessible. If the MLC is already installed, remove it from the mounting surface.

To program the MLC via IR Learning:

1. Apply power to the MLC 52.
2. On the rear panel, set configuration switch 1 to On (up). All front panel buttons should be dimly lit.

3. Press the button on the MLC that will store the IR code that you want the MLC to learn. The following takes place on the MLC:
   - The front panel button that you pressed begins to blink, indicating that it is ready to be programmed. While the button is blinking (5 seconds), you can program it with the desired command. If no IR command is entered within 5 seconds, the button stops blinking.
   - On the rear panel, the IR learning LED for the next button memory block available for programming begins to blink (see **IR learning indicators**, ⑥ under "Rear Panel and Cable Connections" on page 8, for more information on the IR learning LEDs).
   - The LED that indicates how many commands have been programmed onto the button illuminates and remains lit.

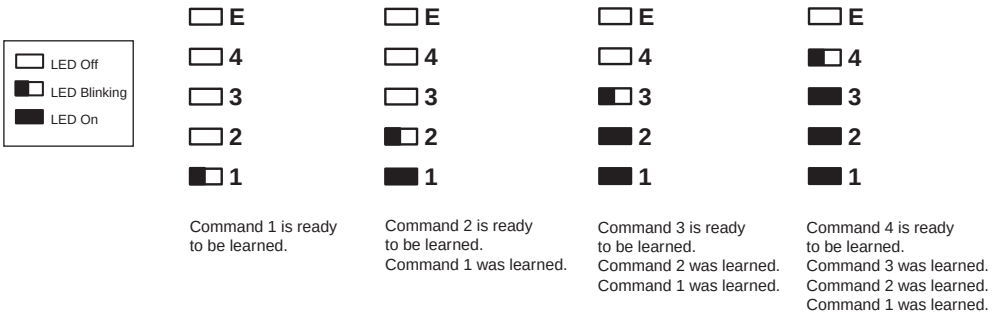


Figure 17. Activation of LEDs During Button Configuration

4. Hold the remote control of the display device between 4 and 14 inches (10 to 36 cm) away from the MLC and point it at the IR Transmit/Receive LEDs on the MLC. **Within 5 seconds of pressing the MLC button** (step **3**), press the button on the remote control whose function you want the selected MLC button to learn.

   NOTE: For repeating command codes, such as those that increment and decrement a function (for example, turning the volume up and down), hold the button on the projector remote control for at least 3 seconds.

   - If no IR command is detected within 5 seconds, the LEDs and the front panel button time out and stop blinking.
   - If the IR code was learned, the rear panel LEDs blink rapidly in succession from the top down, then back up to the top.
   - If the IR code was not learned, the rear panel LEDs blink in random order.

5. If you do not want to program additional commands on the button, repeat steps 3 and 4 for the next button that you want to program.

   If you want to program another command to the same button, press the button again (you can program up to four commands on one button). The next IR learning LED on the rear panel begins flashing (for example, if you have already programmed two commands on this button, the third LED from the bottom flashes).

6. When you are finished programming buttons on the MLC, set configuration switch 1 on the rear panel to Off (down).

7. Press the buttons that you configured to verify that the commands you entered have been learned. If you have an IR Emitter connected on the IR output, it should blink (see **Wiring for IR Control** on page 13).

Removing IR Commands from a Button

If you want to delete a command that has been programmed onto a button, you must remove all the commands programmed to that button as follows:

1. While the MLC 52 is powered on, set configuration switch **1** to On (up).
2. Press the button for which you want to delete commands, then within 2 seconds press the same button again. The IR learning LEDs turn off.
3. Verify that all commands were erased from the button by pressing the same button again. If the commands have been erased, only LED 1 (the bottom LED) blinks; the other LEDs remain off.
4. When finished removing commands, set switch 1 to Off (down).

Setting Up Button Macros Using IR

Buttons function in either **toggle** mode or **macro** mode. By default, all the buttons (except the On and Off Display buttons) are in toggle mode. This means that each press of the button issues one command — the next in sequence of the four commands programmed to the button (each button can store up to four commands).

In macro mode, a single press of a button issues all the commands (up to four) that have been programmed on that button, in the order they were programmed, at 1.5-second intervals. An example of a button macro application would be turning on multiple projectors or displays by pressing one button, one time.

To program an IR macro for a button:

1. Ensure that power is applied to the MLC 52.
2. Set configuration switch **1** on the rear panel to On (up). All front panel buttons light dimly.
3. Program the buttons with the desired commands (see **Configuring Using IR Data Transfer (IR Beaming)** on page 15 or **Configuring Using IR Learning** on page 18 for programming procedures.

   NOTE: You must program the commands onto the button prior to setting it for macro.

4. To put the button in macro mode, press and hold it for 3 seconds. The orange LED on the back panel, labeled “E” (see **figure 18** on page 21) flashes rapidly five times, then turns off, indicating that the button is now configured for macro mode. Release the button. The next time that the button is pressed while configuration switch 1 is in On position, the orange “E” LED lights, indicating that the button is in macro mode.

   To take a button out of macro mode, press and hold the button for 3 seconds. The orange “E” LED turns off.
5. Set configuration switch 1 to Off. Verify that the commands have been properly learned by pressing the button you programmed. The commands should be issued in succession at 1.5-second intervals.

   NOTE: A button is able to learn commands while in macro mode if any of its four command memory blocks are open (not yet programmed with a command).

Configuring a Single Button for Input Source Selection Using IR

If you want to use only one button to select your input sources, you must program the button with one command for each source (up to four). Only one button needs to learn IR commands, and it has enough memory blocks to learn four input selection commands. To use this programmed button to select an input, press it repeatedly to cycle through all the inputs until you reach the desired one.

To program a single button to select multiple inputs:

1. Disconnect power from the MLC 52.
2. To make the one programmed button easily recognizable, replace all but one of the input (Video, PC, DVD, and VCR) button labels with a provided Not Used label, or remove the input labels and leave the buttons blank.
3. Apply power to the MLC.
4. Set configuration switch **1** to On (up). The front panel buttons light dimly.

5. Press the MLC button that will store the input selection IR codes. The button blinks for 5 seconds, during which time it is able to learn codes. On the rear panel, the first (bottom) IR learning LED starts flashing.) If a command is not entered within 5 seconds, the button and LED stop blinking, and you must press the button again to put it in back in learning mode.
6. Within 5 seconds, press the display device remote control button from which the MLC button will learn the first input selection command. If the command has been learned successfully, the IR Learning LEDs on the rear panel blink in rapid progression from the top LED to the bottom, then back to the top.
7. To program a second input selection command on the same button, press the button again. The button and the second rear panel IR learning LED begin to blink. On the remote control of your display device, press the next button whose function you want the MLC button to learn.
8. Repeat the procedure described in steps **5** and **6** for additional commands you want to add to the button you are programming. Each MLC button can be programmed with up to four commands.
9. When finished programming the input selection button, set rear panel DIP switch 1 to Off (down). Verify that the button has been programmed correctly by pressing it repeatedly to cycle through the inputs and observing the display.

Setting Up an MLC 52 VC Model with an Extron Amplifier

If you have an MLC 52 IR VC or an MLC 52 RS VC model, it can be connected to an optional Extron amplifier, such as the MPA Power Amplifier Series, the MP Series preamplifiers, or a PoleVault PVS switcher. The dedicated volume control knob on the VC controllers controls the audio output of an Extron MPA 152 or MPA 401 power amplifier, an MP Series Preamplifier, or a PoleVault PVS switcher, to which speakers for the system are connected.

Wiring the VC Port

To set up this configuration, wire the volume control port to the amplifier as shown in the following diagram. Set up the volume control, following the instructions in the amplifier user guide.

NOTE: Use only Extron devices with the VC port.

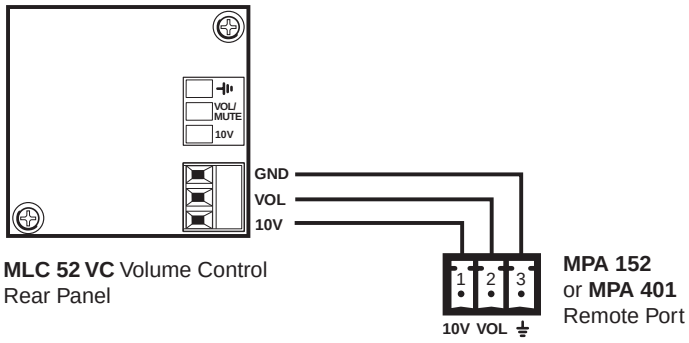


Figure 18. Wiring the VC Volume Control to an MPA Remote Volume Control Port

Figure 19 on the next page shows an example of a system that uses an MLC 52 VC model with an MPA amplifier.

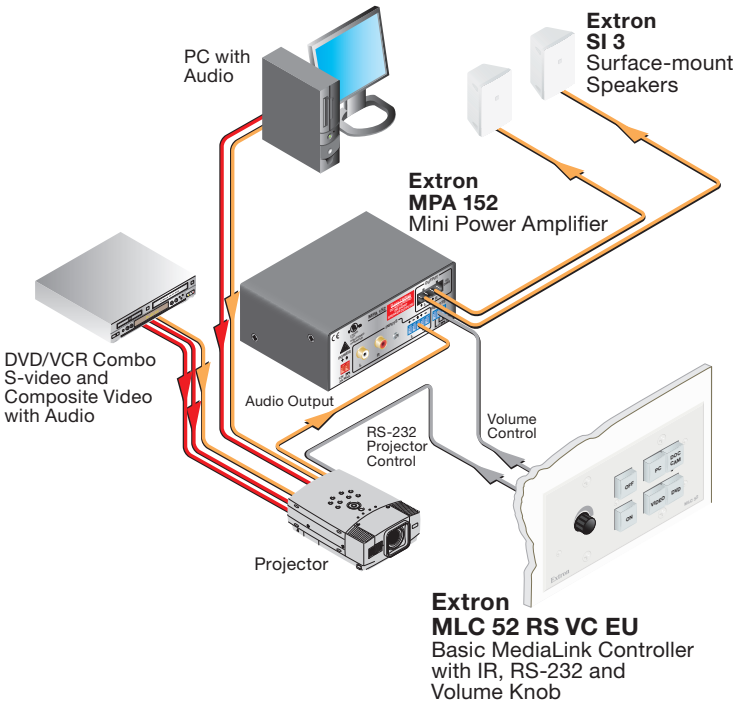


Figure 19. Application Diagram of an MLC 52 RS EU VC with an MPA Series Power Amplifier

Requirements for the MLC 52 VC

To set up a system that contains an MLC 52 VC model and an Extron MPA power amplifier, an MP Series preamplifier, or a PoleVault PVS switcher, you must ensure that the following conditions are met:

- The projector must have dedicated video and audio inputs for each source used in the system.
- The projector must have a switched audio output. On most projectors, this connector is labeled as “Monitor Output” or “Audio Output” (see **figure 20** on the next page). With a switched audio output, the projector outputs the audio from the selected video source.
- The system must incorporate an Extron device.

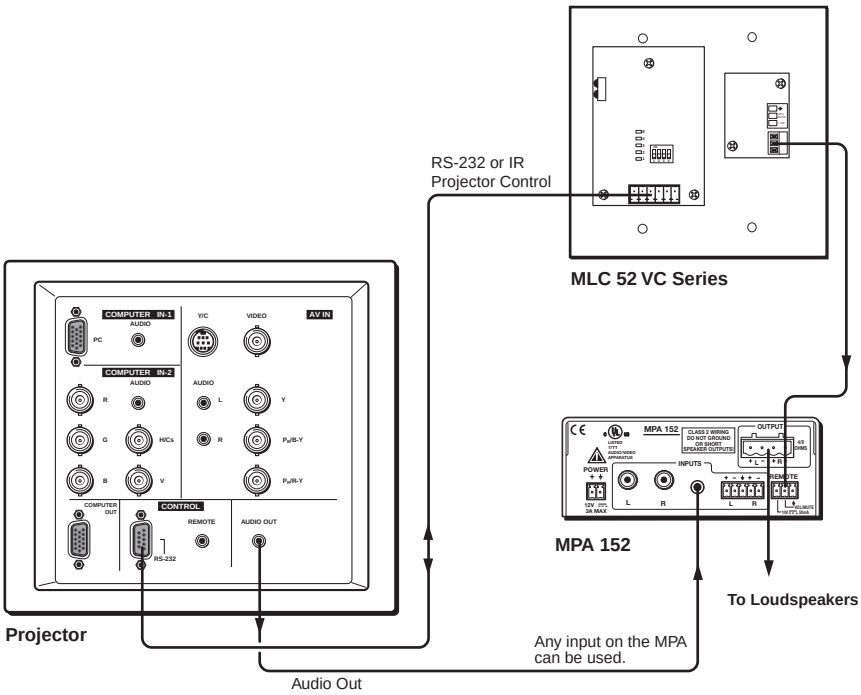


Figure 20. Wiring an MLC 52 VC Controller and an MPA Series Power Amplifier to a Typical Projector

NOTE: Audio is now controlled from the MPA instead of from the projector. For best results, ensure that the audio volume of the projector is set to maximum (assuming that the monitor output for audio is variable).

Configuring the MLC 52 IR VC and MLC 52 RS VC Vol Buttons

By default, the MLC 52 has two buttons on the front panel programmed for volume control (Vol ▲ and Vol ▼). However, on the MLC 52 VC models, these buttons are not needed for volume control and can be programmed for other uses. To reprogram the Vol buttons, you can use IR Learning (see **Configuring Using IR Learning** on page 18) or the MLC 52 configuration program (see the program help file).

Mounting the MLC 52

After the system has been cabled, configured, and tested, you can mount the MLC.

Preparing the Site

NOTE: The installation of the MLC 52 must conform to national and local electrical codes and to the equipment size requirements.

Installation using a UL listed wall box is recommended for most mounting options, but for US models a mounting bracket can be used instead. To cut a hole in the mounting surface for the controller, use the dimensions from one of the rough-in templates provided under **Templates for the MLC 52 and MLC 52 VC (US Models)** on page 64 as a guide to measure and mark the hole. The templates provide measurements for installing the MLC with either an electrical box or a mounting bracket.

ATTENTION: The templates are not to scale and are provided for reference only.

- The standard US MLC 52 model includes a one-gang black or white plastic faceplate, which can be installed on a standard one-gang US electrical box that is at least 1.75 inches deep. A mounting bracket ("mud ring") is also included.
- The US MLC 52 VC model includes a two-gang black or white plastic faceplate, which can be installed in a standard US two-gang electrical box. A mud ring is also included.
- The MLC 52 EU and MLC 52 VC EU models have two-gang RAL 9010 white or brushed aluminum faceplates that can be installed on standard two-gang European electrical boxes.
- The standard MLC 52 MK model includes a one-gang white or brushed aluminum faceplate, which can be mounted on a 47 mm deep single MK electrical box.
- The MLC 52 VC MK model includes a two-gang white or brushed aluminum faceplate, which can be mounted on a 47 mm deep double MK electrical box.

NOTE: EU and MK models must be mounted in an electrical box.

To prepare the site:

1. Choose a location that will allow cable runs without interference. Allow enough depth for both the wall box and the cables. You may need to install the cables into the wall or furniture before installing the controller. If using an electrical box to wall mount the controller, locate a stud to which the box will be attached.
2. Measure and mark the portion to be cut out of the mounting surface.

   For US models, use the appropriate template and faceplate dimensions provided **Templates for MLC 52 and MLC 52 VC (US Models)** on page 64 as a guide to measure and mark the area to cut out. If you are using a mounting bracket, see the template that came with the bracket.
3. Cut out the opening in the wall or furniture.

Mounting the MLC to an Electrical Box

You can mount the MLC 52 to an electrical box or a mounting bracket. For information on mounting the electrical box itself, see **Mounting an Electrical Box** on page 63. To attach a mounting bracket to a wall or furniture, see the instructions provided with the bracket.)

ATTENTION: If using an electrical box, ensure that it is grounded properly.

1. If you want to install a different faceplate, attach the MLC to the desired faceplate using the provided screws (see **Replacing the Faceplate (US Models Only)** on page 9).
2. Disconnect power at the source.
3. Pull the cables through the wall and electrical box, and connect all cables to the MLC.
4. Insert the MLC into the wall or furniture.
5. Secure the MLC to the wall box or mounting bracket with the provided machine screws (as shown in **figure 21** on the next page), or attach it directly to the furniture with wood or metal screws.

6. Ground the MLC to the electrical box as follows:
   a. Attach the bare wire end of the provided grounding wire to the Gnd pin of the 6-pole captive screw connector on the MLC rear panel.
   b. Attach the other end of the grounding wire to a screw on the junction box.

NOTE: Do not ground a product to both a separate earth ground and the circuit ground (via a connector pin). If you tie a product to two different ground sources, you may introduce ground loops or other grounding-related problems into the system.

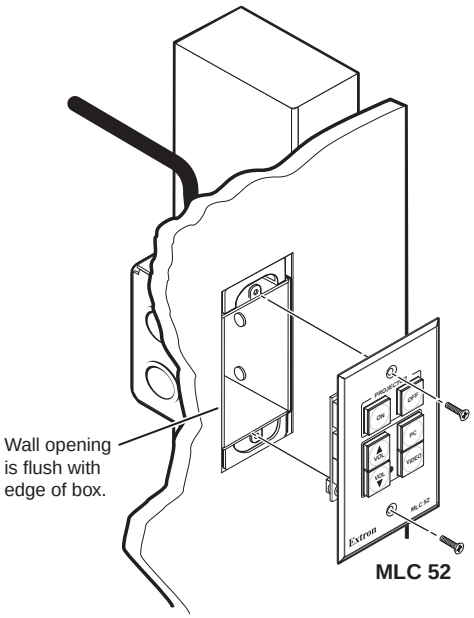


Figure 21. Mounting the MLC 52 to an Electrical Box

Mounting the MLC to a Decora Mounting Bracket

A one-gang or two-gang (depending on your model) Decora style mounting bracket ("mud ring") is provided with the MLC 52 models. If desired, you can mount the MLC to this type of bracket instead of to an electrical box.

To mount the controller to a Decora style mounting bracket:

1. Cut a hole in the mounting surface large enough to accommodate the provided mounting bracket.
2. Insert the mounting bracket into the hole.
3. Turn the two screws on the bracket so that the locking arms rotate behind the mounting surface until they clamp securely to it. Do not overtighten.
4. Run the cables through the mounting bracket and attach them to the MLC.
5. Place the MLC with its faceplate attached onto the bracket so that the screw holes at the top and bottom of the faceplate line up with the holes at the top and bottom of the bracket.
6. Attach the MLC to the bracket, using the provided screws in the holes at the top and bottom of the faceplate.

See **figure 22** on the next page.

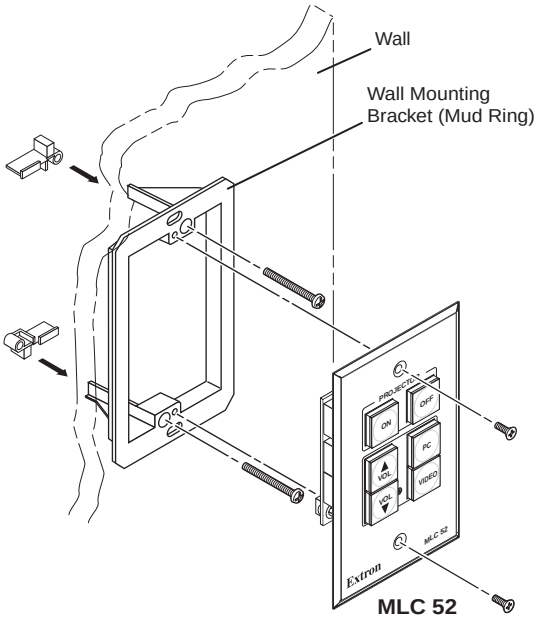


Figure 22. Mounting an MLC 52 to a Decora Mounting Bracket

Mounting the MLC to a Wall or Furniture

1. With all cables attached to the MLC and power disconnected at the source, insert the MLC into the wall or furniture.
2. Fasten the MLC and faceplate directly to the furniture or wall using wood screws.

Operation

This section describes the front panel features of the MLC 52 models and provides procedures for operating the controllers. Topics include:

- **Front Panel Features**
- **Selecting Inputs**
- **Resetting**
- **Locking the Front Panel (Executive Mode)**

Front Panel Features

The MLC 52 front panel contains six buttons, each of which can be programmed with up to four IR or RS-232 commands or functions.

Buttons on the Front Panel

The front panel backlit buttons light amber when the MLC 52 is powered on. Buttons that are not currently selected and active are lit more dimly (25% brightness) than the selected ones (100% brightness).

You can program commands onto these buttons (up to four commands per button) using IR Learning (see **Configuring Using IR Learning** on page 18, the MLC 52 configuration software via the configuration port, or IR data transfer from a configured MLC 52 (see **Configuring Using IR Data Transfer [IR Beaming]** on page 15).

Switch modes

Depending on the driver that you load to your MLC (see **Loading Extron Drivers** on page 52), each of the buttons is preconfigured in one of the following switch modes:

- **Single switch mode:** In this mode, the button operates independently of the other buttons. Pressing a button in this mode does not affect any other button.
- **Input switch mode:** Buttons in this mode are grouped together so that only one of them can be active at a time. When one button is activated, it becomes fully lit, while the other (inactive) buttons are dimmed to 25% brightness. When you press one of the buttons in input mode, all other buttons in input mode become inactive.
- **Volume mode:** This mode is available only on the standard (not VC) MLC models, and only for the two buttons that are labeled Vol ▲ and Vol ▼. When an RS-232 driver that contains a volume table is part of the configuration, pressing a button in volume mode accesses the volume table of the driver. Press and **hold** the appropriate button to raise or lower the volume of the projector or display by the amount specified in the volume table. When the MLC is in volume mode, the button labeled Vol ▲ always increases the volume; Vol ▼ lowers it.

NOTE: If the driver for your display device contains a volume table, a single press of the volume button has no effect. You must press and hold the button to increase or decrease the volume.

- **Power mode:** The two Display buttons at the top of the front panel, labeled On and Off, are permanently in power mode. This mode is similar to input mode. The two Display buttons are mutually exclusive; if you press one, the other one becomes unlit.

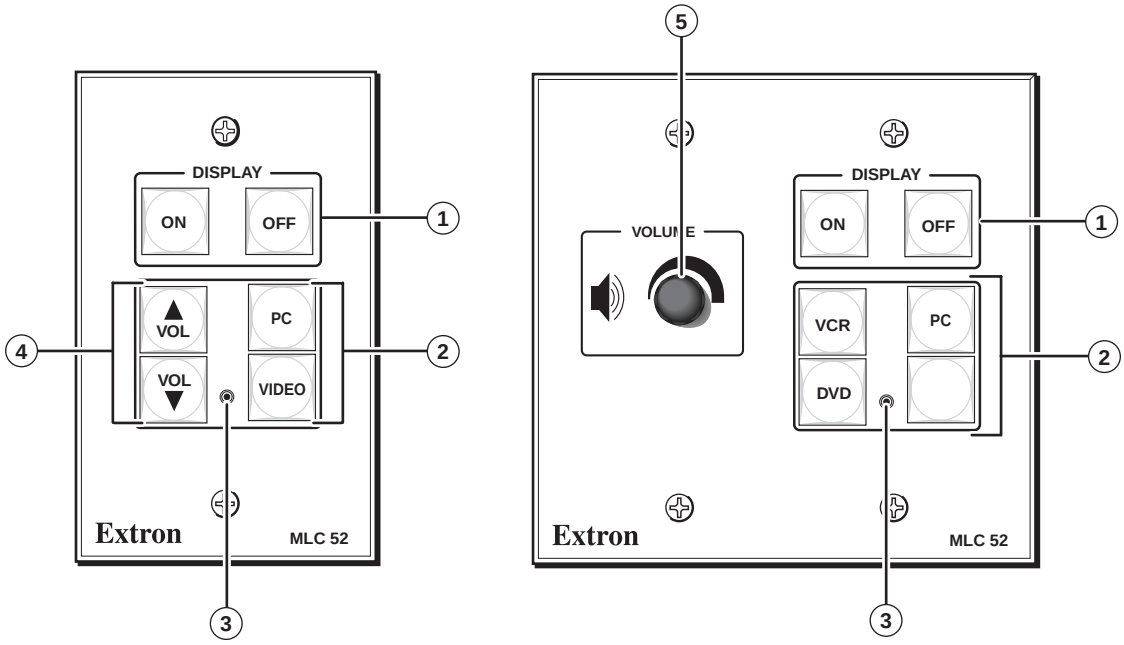
NOTE: You can also set up button macros using IR (see **Setting Up Button Macros Using IR** on page 20).

To change the switch mode of a button (except the display buttons), you must use the configuration software (see the configuration program help file for the procedure).

Front Panel Components

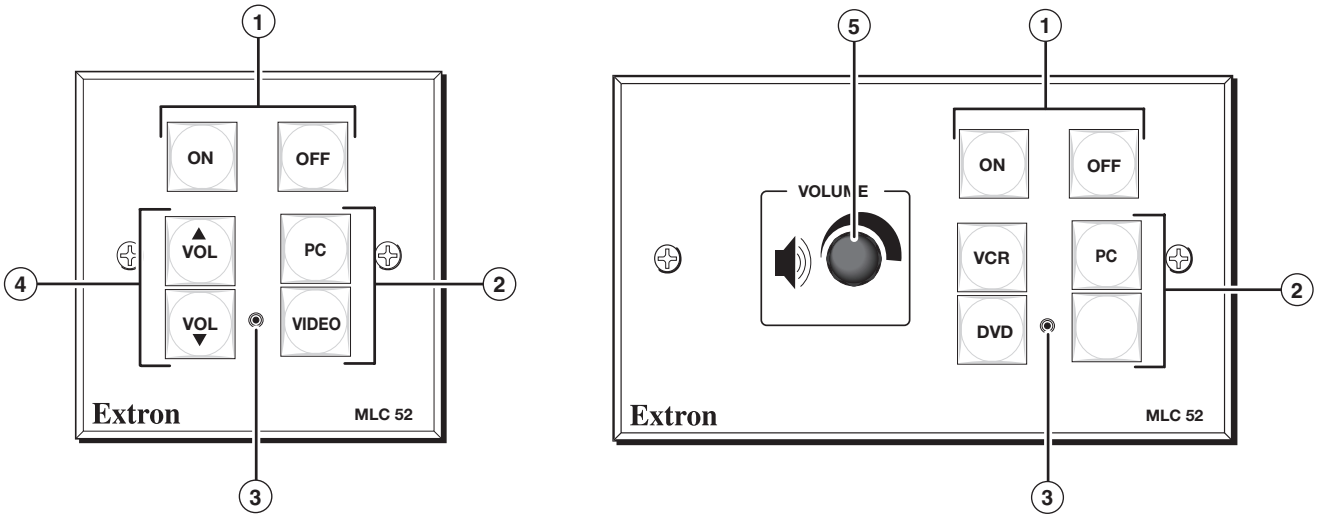
The following diagrams show the front panels of the standard and VC versions of all MLC 52 models.

NOTE: The front panel buttons are prelabeled for convenience. You can relabel them using the other labels that are provided (see **Replacing Button Labels** on page 10 for the relabeling procedure).



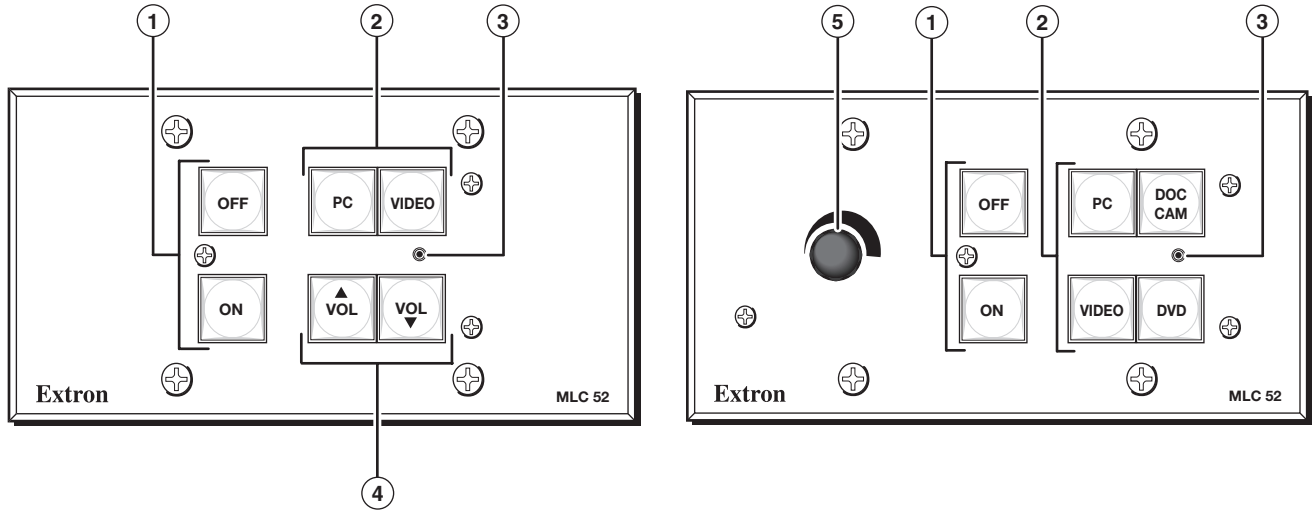
MLC 52 IR and RS **MLC 52 IR VC and RS VC**

Figure 23. MLC 52 and MLC 52 VC Front Panels



MLC 52 RS MK **MLC 52 RS MK VC**

Figure 24. MLC 52 RS MK and MLC 52 RS MK VC Front Panels



MLC 52 RS EU **MLC 52 RS EU VC**

Figure 25. MLC 52 RS EU and MLC 52 RS EU VC Front Panels

① **Display power buttons** — The display power buttons turn power to the projector or display on and off. Because the display device can be only on or off at a given time, these buttons are programmed in an exclusive switch group.

> **NOTE:** A 2-second hold feature, requiring you to press and hold the Off button for 2 seconds in order to turn off the display device, helps prevent accidental powering off of the projector or display. This feature can be disabled and enabled through the configuration software (see the MLC 52 Configuration Program help file for further information).

② **Input selection buttons** — These buttons are preprogrammed to select input sources. By default, they are in input mode; that is, only one of them can be selected at a time. If you want these buttons to operate independently of each other, use the MLC 52 configuration software to remove the group configuration from them and change to single switch mode.

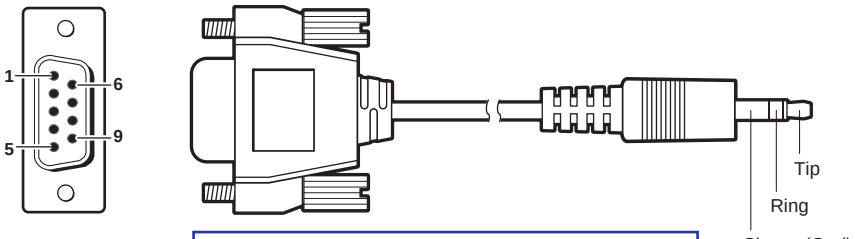
③ **Configuration port** — Connect this port to your computer RS-232 port to configure and communicate with the MLC. Through this port, the MLC receives commands issued via the configuration software on your computer.

Use a 2.5 mm TRS to 9-pin D-sub connector cable to connect the MLC to your PC via this 2.5 mm female TRS (tip-ring-sleeve) connector.

NOTE: This cable is an optional accessory that can be ordered from Extron (part number 70-335-01).

The protocol for this configuration port is as follows:

- 9600 baud
- 8 data bits
- 1 stop bit
- No parity



9-pin D	Connection	TRS Plug
Pin 2	Computer Rx line	Tip
Pin 3	Computer Tx line	Ring
Pin 5	Computer signal ground	Sleeve

Figure 26. 2.5 mm TRS Cable for the Configuration Port

See the MLC 52/DVCM 50 Configuration Program help file for details about using the software to set up the system.

④ **Volume adjustment buttons** (Standard MLC 52 models only) — These two buttons are used to adjust the volume of the projector or display up and down.

If your AV system does not require the volume up and down function (for example, if the MLC is configured with the VC faceplate containing the volume control knob), you can reprogram these buttons for input selection or additional display device functions (see the MLC 52/DVCM 50 Configuration Program help file for reprogramming instructions).

⑤ **Volume control knob** — (MLC 52 VC models only) The volume control knob on the VC models enables you to adjust the volume of the display device via an Extron device such as an MPA Series power amplifier, an MP Series preamplifier, or a PoleVault PVS switcher.

NOTE: Use only Extron devices with a VC port.

Selecting Inputs

The four buttons below the On and Off buttons on the front panel can be configured to select inputs on the display device. The PC and Video buttons have been preconfigured to select inputs — a desktop or laptop computer (PC); a VCR or DVD (Video).

Using IR learning, IR data transfer, or the MLC 52 configuration software, you can reconfigure these buttons and add commands to them to select other inputs if desired. The two volume (Vol) buttons on the standard MLC can be configured to select inputs as well, if you do not need them to control projector or display volume. Up to four commands can be programmed on any button (see the MLC 52/DVCM 50 Configuration Program help file for information on configuring MLC buttons).

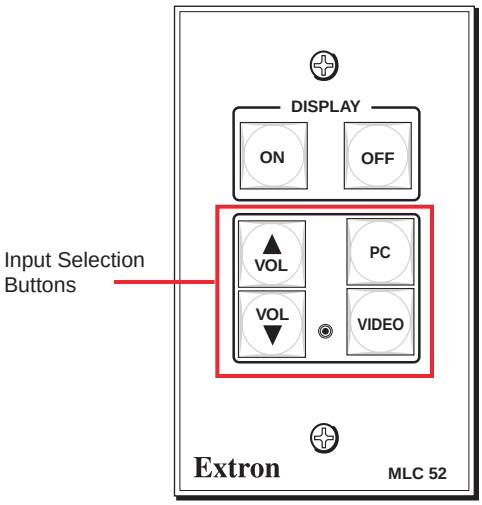


Figure 27. Input Selection Buttons on the MLC 52 Front Panel

To select an input, press and release the appropriate input selection button. The command that was programmed in the first memory block of the button is executed.

- All buttons are lit at 25% intensity while the MLC receives power. A selected (active) input button lights more brightly than the other buttons.
- If there is more than one input selection command programmed in the button memory blocks, you can execute the commands in memory blocks 2, 3, and 4 by pressing the button a second, third, and fourth time.

  For example, if you have programmed memory block 1 on the Video button for a VCR, and block 2 for a DVD player, you would press and release the Video button once to select the input to which the VCR is connected on the display, then a second time to select the DVD input. (Pressing it a third time reselects the VCR, and so on.)
- If an input selection button is in macro mode, pressing the button once executes all the commands stored on that button, in memory block order (the command in memory block 1 is performed first, then block 2, and so on) (see **Setting Up Button Macros Using IR** on page 20).

Resetting

In the event that the MLC 52 needs to be reset, you can do so by one of the following methods:

- **Factory firmware reset** — Press and hold the bottom right button (the Video button on standard models or the blank button on VC models) while applying power to the MLC. This method resets the MLC firmware to the version with which the unit was delivered from the factory. Any commands that you previously programmed for the buttons remain in effect.
- **Factory configuration reset** — Press and hold the On and Off buttons simultaneously while applying power to the MLC. This method removes all commands from the buttons.

You can also reset the MLC to its factory defaults via the MLC 52 configuration software (see the MLC 52/DVCM 50 Configuration Program help file for more information).

Locking the Front Panel (Executive Mode)

To prevent access by unauthorized users, or accidental presses of the button issuing unwanted commands to devices, the front panel controls can be locked using executive mode. When the MLC 52 is in executive mode, all front panel functions are locked, so that pressing the buttons has no effect.

If a button is pressed while the MLC 52 is in executive mode, all the front panel buttons blink, indicating that the front panel is locked.

To place the MLC in executive mode:

1. Power off the display device. Executive mode cannot be enabled if the device is on.
2. On the standard MLC 52 models, press and hold the Vol ▲ and Video buttons simultaneously for 5 seconds.

   On the VC models, press and hold the unlabeled button (bottom right) and the VCR button simultaneously for 5 seconds.

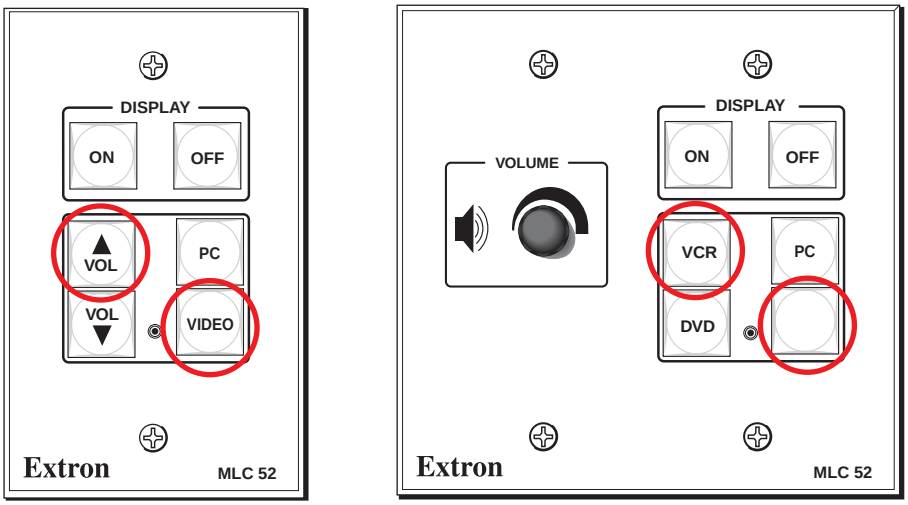


Figure 28. Buttons to Press and Hold for Executive Mode

When the MLC enters executive mode, all front panel buttons flash three times, then return to their original state.

To exit executive mode, press the same two buttons again, holding them for 5 seconds.

Special Applications

This section describes some special types of applications that represent unique conditions. For the MLC 52 to operate properly in these situations, it is important that the controller be configured correctly. In this section, three application examples are described, along with their requirements for the MLC 52.

- **Application 1: Using Multiple Sources with an MLC 52**
- **Application 2: Controlling Projectors that Require Power Off Confirmation**
- **Application 3: Controlling Projectors that Have Multi-coded IR Functionality**

When setting up the front panel buttons for these applications, keep in mind the following:

- **Switch modes:** You can configure buttons to operate independently of each other (single switch mode), or to function as a group (input mode). To set the button switch mode, see **Switch modes** on page 27.
- **IR command modes:** In macro mode, one button press issues up to four commands in succession at 1.5 intervals. In toggle mode, one button press issues only one command. See **Setting Up Button Macros Using IR** on page 20 to set up buttons using IR.

Application 1: Using Multiple Sources with an MLC 52

Following is an example of an application in which the system contains more than two inputs. This system has two PC inputs (a laptop and a desktop) and two video inputs (a VCR and a DVD).

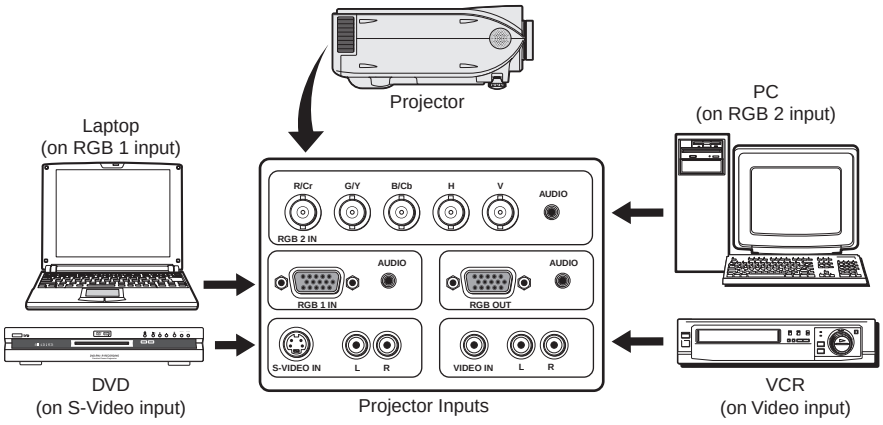


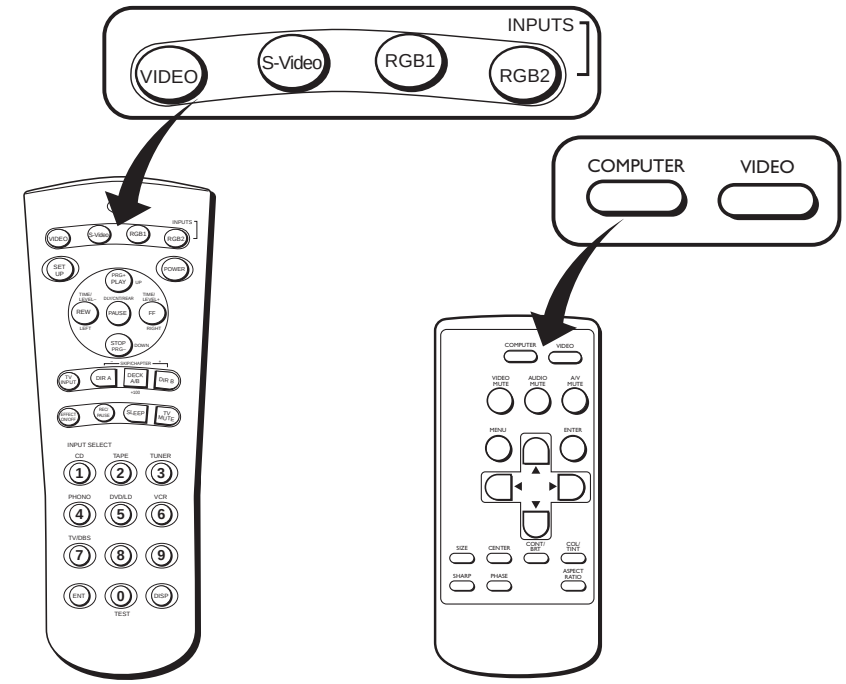
Figure 29. Application 1: Projector with More Than Two Inputs

For best results, choose a projector that has dedicated audio and video input connectors for each PC and each video source. Do not use a projector on which multiple video inputs share one audio input.

The MLC 52 is configured differently depending on the type of projector remote control that will be used and on whether the MLC will use IR or RS-232 projector control. Because each button on the MLC 52 can store up to four commands per button, the PC and Video buttons should be programmed as shown in the illustrations below and on the following pages.

- **IR control:** If the projector will be controlled by the MLC 52 using IR, its IR remote control has one of the following types of button configurations for video selection:
  - **Projector remote control type A:** A different remote control button is used for each video input source. Each button selects the input source with the signal type that matches the button label (for example, the RGB1 button might select the laptop computer while RGB2 selects the desktop PC.)
  - **Projector remote control type B:** One remote control button is used for all video formats (RGB, S-video, and composite video). This type of button must be pressed repeatedly to toggle through all the inputs with the same format.
- **RS-232 control:** If the projector is to be controlled by the MLC 52 RS via RS-232 commands, the projector typically has a discrete (specific) command for selecting a particular video input. That is, the projector does not have an RS-232 command to toggle through its video inputs.

Programming Buttons for an IR Controlled System



Projector Remote Type A Projector Remote Type B

Figure 30. Examples of Projector Remote Control Types A and B

The illustrations on the following pages show the commands to program to the memory slots on the MLC input selection buttons from the two types of projector remote controls when the projector is controlled via IR. Determine which of these two types most resembles the hand-held remote control of your projector, then select the appropriate instruction set from the following sections to program IR commands to your MLC 52.

Projector remote control type A (application 1)

This remote control has a discrete button for each input. Two buttons are designated for RGB inputs, one for S-video, and one for video (composite).

- Use IR learning to program the command from each of the projector remote control RGB input selection buttons onto the MLC PC button.
- Use IR learning to program the commands from the projector remote control Video and S-video buttons onto the MLC Video or blank (VC models) button.

(See **Configuring Using IR Learning** on page 18 for the IR learning procedure.)

The MLC now has two commands each on the PC and Video or blank (VC models) buttons. This enables you to switch between the two PC inputs by repeatedly pressing the PC button, and between the two composite/S-video inputs by repeatedly pressing the Video or blank button.

Standard MLC 52 models with a type A remote control

If you are using a standard (non-VC) MLC 52 IR or an MLC 52 RS with a type A remote control, program the buttons using the following scheme:

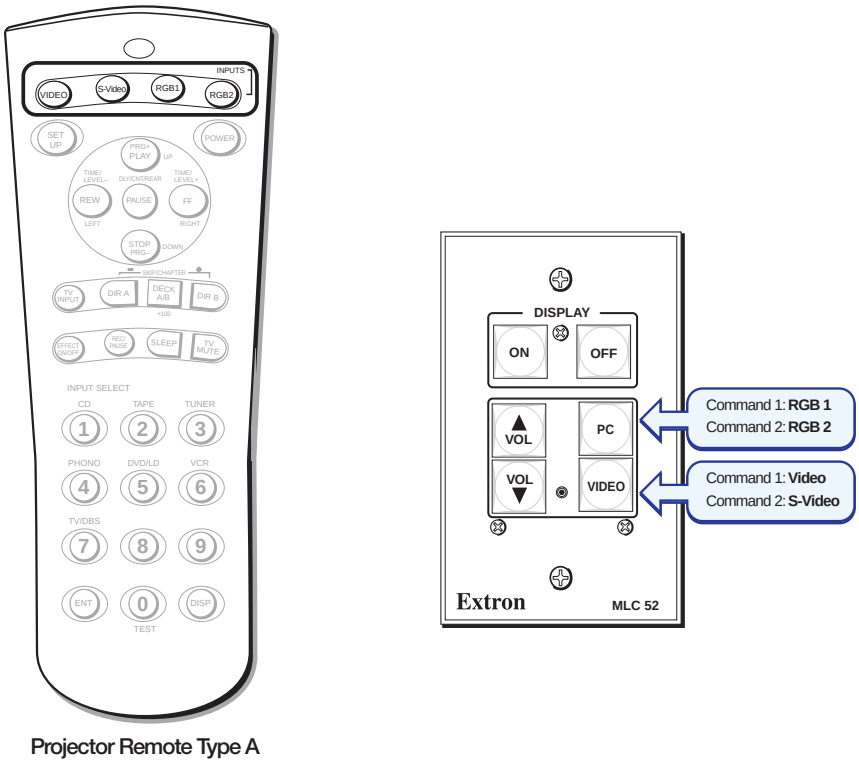


Figure 31. Programming MLC 52 Input Selection Buttons from a Projector Remote Control Type A

MLC 52 VC models with a type A remote control

If you are using an MLC 52 IR VC or an MLC 52 RS VC model with a type A remote control, program the buttons using the following scheme:

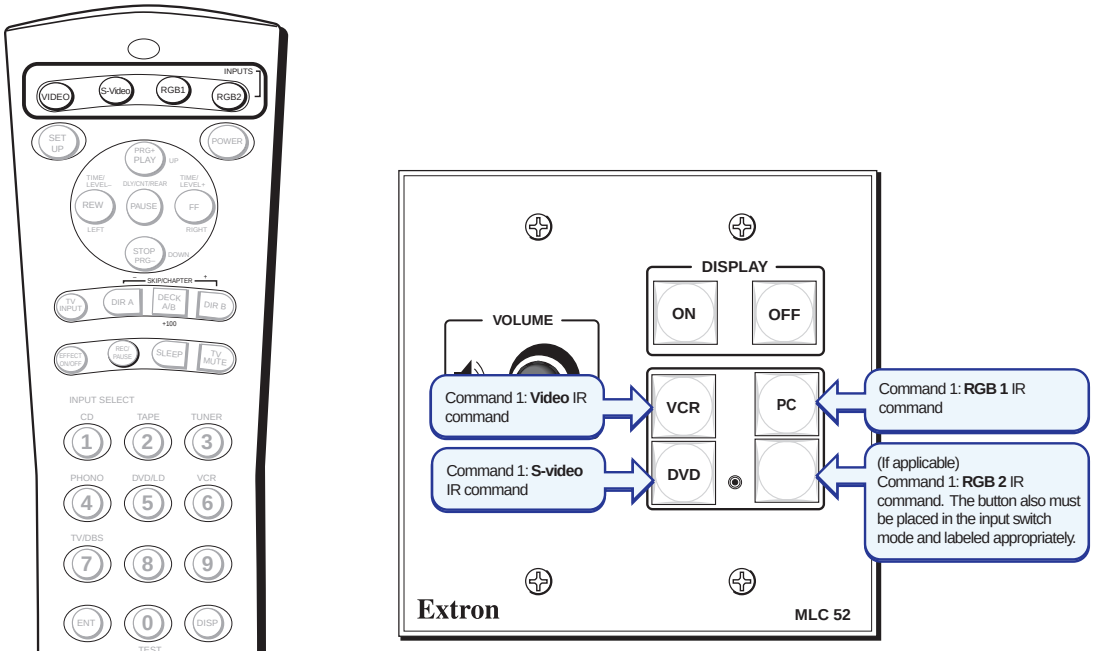


Figure 32. Programming MLC 52 IR VC and MLC 52 RS VC Input Selection Buttons from a Projector Remote Control Type A

Projector remote control type B (application 1)

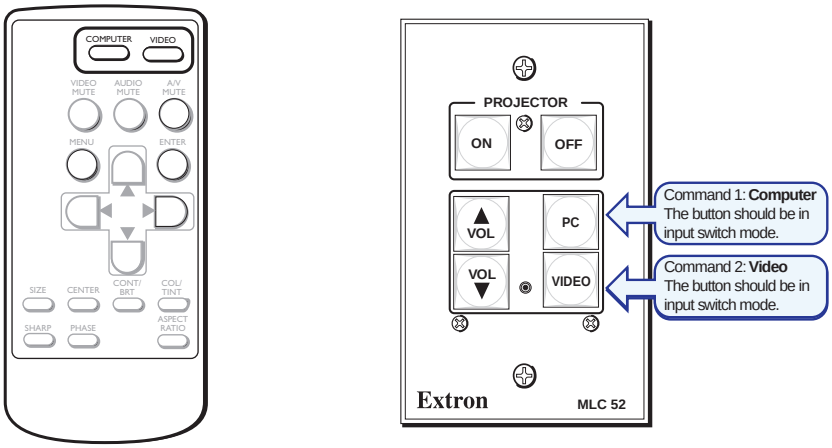
This remote control has only two input buttons — one for the RGB inputs and one for the S-video and composite video inputs. Each of these buttons contains one command that causes the projector to toggle between inputs.

- Program the command from the Computer or RGB button of the projector remote control onto the PC button of the MLC.
- Program the command that is on the Video button of the projector remote control onto the Video button of the MLC.

The MLC now has one command each on its PC and Video buttons. You must still repeatedly press an input button to switch between selected sources; however, the button actually contains only one command (a projector input toggle command).

Standard MLC 52 with a type B remote control

If you are using an MLC 52 IR or an MLC 52 RS with a type B remote control, program the buttons using the following scheme:

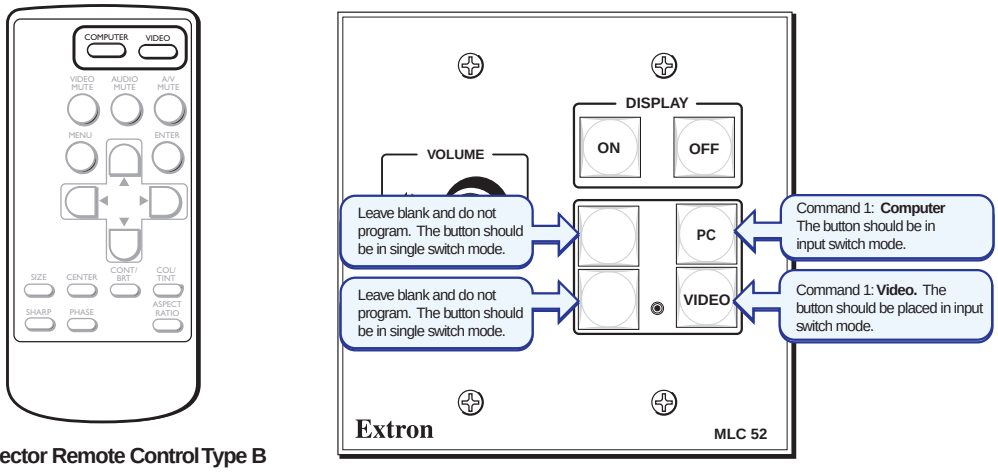


Projector Remote Control Type B

Figure 33. Programming MLC 52 Input Selection Buttons from a Projector Remote Control Type B

MLC 52 VC models with a type B remote control

If you are using an MLC 52 IR VC or an MLC 52 RS VC with a type B remote control, program the buttons using the following scheme:



Projector Remote Control Type B

Figure 34. Programming MLC 52 IR VC and MLC 52 RS VC with a Projector Remote Control Type B

Programming Buttons for Multiple Inputs on an RS-232 Controlled System

If the MLC 52 RS will control the projector via RS-232, you do not need to use the projector remote control. Program the MLC buttons directly via the front panel configuration port using the configuration software (see the configuration program help file for instructions on programming RS-232 commands to MLC buttons).

1. Program commands 1 and 2 on the PC and Video buttons with the projector RS-232 command for discrete input selection. The MLC now has two commands each on the PC and Video buttons.
2. Press the buttons repeatedly to switch between the two input selection commands that you entered on each button.

Application 2: Controlling Projectors that Require Power Off Confirmation

Some projectors controlled via IR require the Power Off button on the hand-held remote control to be pressed twice to turn off the projector. These projectors usually present a prompt (similar to the one shown below) on the image, instructing you to press the Power Off button again to confirm your intent to power off the projector. (If the projector is controlled via RS-232, this prompt is usually not displayed.)

Figure 35. Typical Projector Power Off Confirmation Prompt

The MLC 52 can be configured so that the projector Power Off button does not need to be pressed twice for confirmation. Using the macro mode feature, you can send two power off commands sequentially from a single press of the MLC Off button.

To configure the MLC Off button to issue both a power off and a power off confirmation command:

1. Ensure that power is applied to the MLC 52.
2. Set configuration DIP switch 1 on the rear panel to On (up).
3. Program the first two command memory blocks (commands 1 and 2) on the MLC Off button with a projector off command (see **Configuring Using IR Learning** on page 18 for procedures).

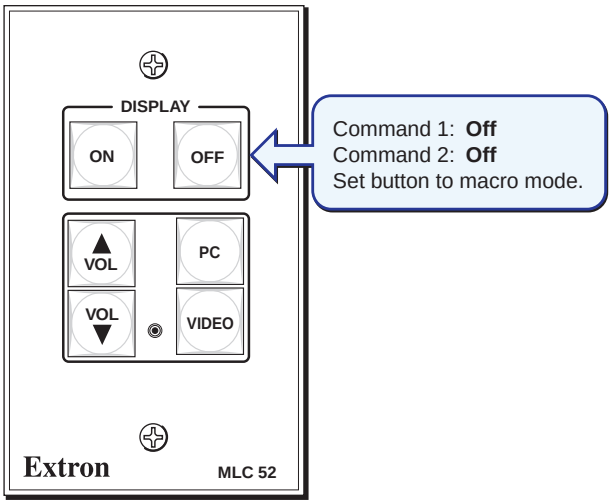


Figure 36. Programming the Off Button for a Projector that Requires a Confirmation

4. Put the MLC Off button that you have just programmed into macro mode by pressing and holding the button for 3 seconds. The orange LED on the back panel, labeled "E," flashes rapidly five times, then turns off, indicating that the button is now configured for macro mode.
5. Set configuration DIP switch 1 on the MLC rear panel to Off (down).

Now, with one press of the MLC Off button, you can issue the command to projector off and respond to the projector confirmation prompt. The commands are issued in succession at 1.5-second intervals.

Application 3: Controlling Projectors That Have Multi-coded IR Functionality

Certain projectors, such as Philips projectors, have multiple IR codes for the same function. Projectors with multi-coded IR functionality issue two commands for each IR remote control button. Command "A" is initiated by the first press of the button; command "B" is initiated by the second press. Because the buttons on the MLC 52 can store up to four commands, it is ideal for projectors of this type.

If controlled via RS-232, projectors that have multi-coded IR functions typically have a specific RS-232 command that selects or performs each desired function. Therefore, there is no command "A" or "B" for RS-232 control.

This section provides instructions for using IR learning to program multiple input selection commands onto the MLC 52 buttons from two common types of hand-held projector remote controls that have multi-coded IR functionality.

NOTE: For best results, select a projector that has a dedicated audio and video input for each source used in the system. Video and audio should not share an input.

Configuration for a System with a Projector Remote Control Type A (Application 3)

A type A remote control has a discrete button for each input (see **page 34**). Two buttons are designated for RGB inputs, one for S-video, and one for video (composite). Each of these input selection buttons on the type A remote control has a command "A" and "B" coded on it. Follow these steps to use IR learning to program the input selection commands from the projector type A hand-held remote control onto the MLC PC and Video buttons.

NOTE: When a command has been successfully learned, the IR learning LEDs on the MLC rear panel flash in rapid progression from top to bottom, then back to top.

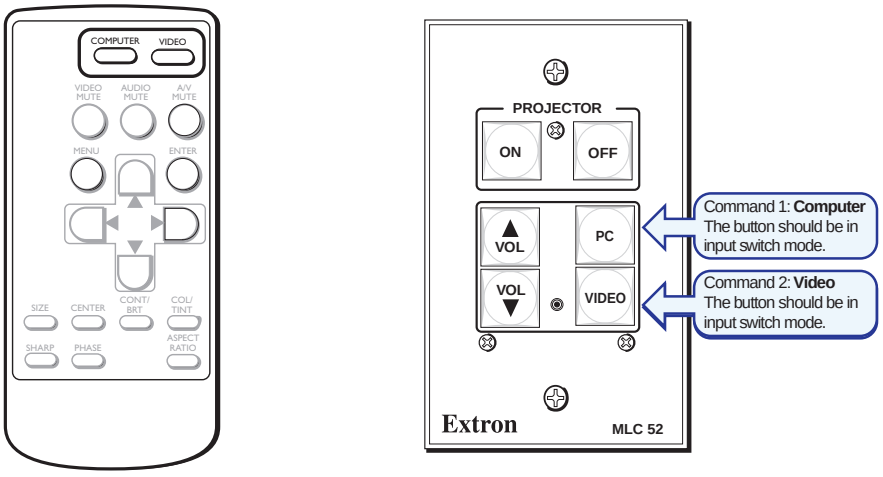
Programming RGB inputs — projector remote control type A

1. Place the rear panel configuration DIP switch 1 in the On (up) position to enable learning mode.
2. Using IR learning, program command "A" from the RGB 1 input selection button on the projector remote control into memory block 1 of the MLC PC button:
   a. Press the PC button on the MLC front panel. The button blinks, indicating that the MLC is ready to learn the command. On the rear panel, the bottom IR learning LED should be flashing.
   b. Within 5 seconds (while the PC button on the MLC 52 is blinking), press the RGB 1 button on the remote control. The MLC learns command "A" for RGB 1.

3. Program the input selection command “A” from the RGB 2 input selection button on the projector remote control into memory block 2 of the MLC 52 PC button:
   a. Press the PC button on the MLC front panel. The button blinks, indicating that the MLC is ready to learn the command. On the rear panel, the second LED from the bottom flashes.
   b. Within 5 seconds (while the PC button on the MLC 52 is blinking), press the RGB 2 button on the remote control. The MLC learns command “A” for RGB 2.
4. Program the input selection command “B” from the RGB 1 input selection button on the projector remote control into memory block 3 of the MLC 52 PC button:
   a. Press the PC button on the MLC front panel. The button blinks, indicating that the MLC is ready to learn the command. On the rear panel, the third LED from the bottom flashes.
   b. Within 5 seconds (while the PC button on the MLC 52 is blinking), press the RGB 1 button on the projector remote control. The MLC learns command “B” for RGB 1.
5. Program the input selection command “B” from the RGB 2 input selection button on the projector remote control into memory block 4 of the MLC 52 PC button:
   a. Press the PC button on the MLC front panel. The button blinks, indicating that the MLC is ready to learn the command. On the rear panel, the fourth LED from the bottom flashes.
   b. Within 5 seconds (while the PC button on the MLC 52 is blinking), press the RGB 2 button on the remote control. The MLC learns command “B” for RGB 2.
6. If finished programming the MLC 52 buttons, return configuration DIP switch 1 to its Off (down) position, and test the system.

   If you want to program video input selection at this time, proceed to “Programming video inputs — projector remote control type A.”

Programming video inputs — projector remote control type A



Projector Remote Control Type B

Figure 37. Programming MLC 52 Input Selection Buttons from a Projector Remote Control Type A

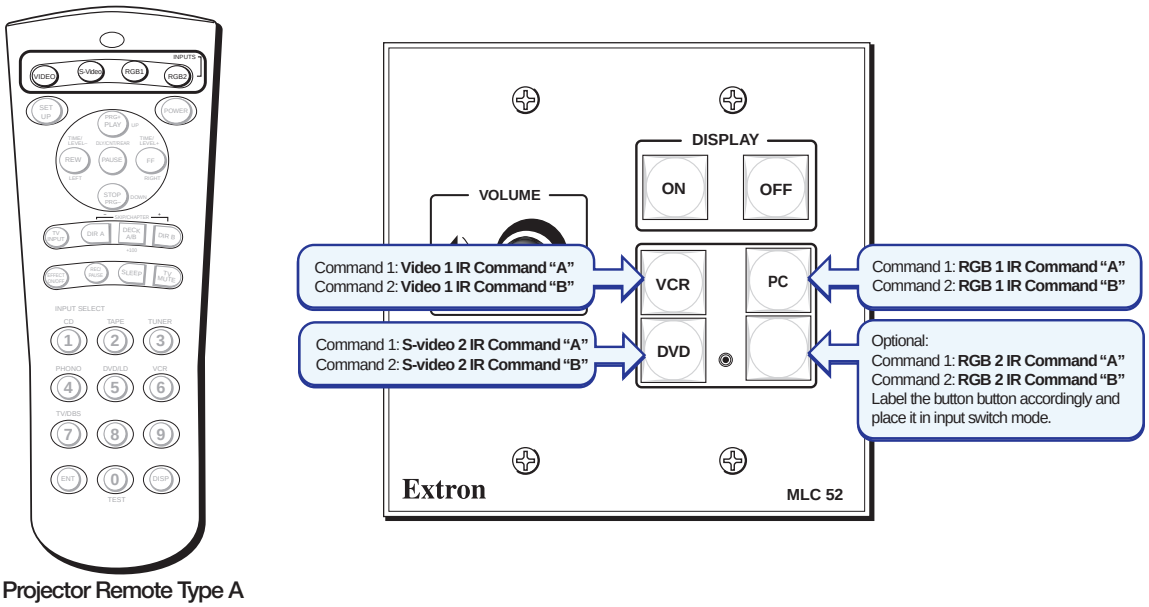


Figure 38. Programming an MLC 52 VC with a Projector Remote Control Type A

1. Place the rear panel configuration DIP switch 1 in the On (up) position to enter learning mode. (If the MLC is already in learning mode, proceed to step 2.)

2. Using IR learning, program command "A" from the Video input selection button on the projector remote control into memory block 1 of the Video or blank button (for VC models) as follows:
   a. Press the Video button on the MLC front panel. The button blinks, indicating that the MLC is ready to learn the command. On the rear panel, the bottom IR learning LED flashes.
   b. Within 5 seconds (while the Video button on the MLC 52 is blinking), press the Video or blank button on the projector remote control. The MLC has learned command "A" for video.
3. Program the input selection command "A" from the S-video input selection button on the projector remote control into memory block 2 of the MLC 52 Video or blank button as follows:
   a. Press the Video or blank button on the MLC front panel. The button blinks, indicating that the MLC is ready to learn the command. On the rear panel, the second LED from the bottom flashes.
   b. Within 5 seconds (while the Video or blank button on the MLC 52 is blinking), press the S-video button on the projector remote control. The MLC learns command "A" for S-video.
4. Program the input selection command "B" from the Video selection button on the projector remote control into memory block 3 of the MLC 52 Video or blank button as follows:
   a. Press the Video or blank button on the MLC front panel. The button blinks, indicating that the MLC is ready to learn the command. On the rear panel, the third LED from the bottom flashes.
   b. Within 5 seconds (while the Video or blank button on the MLC 52 is blinking), press the Video button on the projector remote control. The MLC learns command "B" for video.

5. Program the input selection command “B” from the S-video input selection button on the projector remote control into memory block 4 of the MLC 52 Video or blank button as follows:
   a. Press the Video or blank button on the MLC front panel. The button blinks, indicating that the MLC is ready to learn the command. On the rear panel, the fourth LED from the bottom flashes.
   b. Within 5 seconds (while the Video or blank button on the MLC 52 is blinking), press the S-video button on the projector remote control. The MLC learns command “B” for S-video.
6. When finished programming the MLC 52 buttons, return configuration switch 1 to its Off (down) position.
7. Test the system.

Issuing input selection commands learned from a type A remote control from non-VC models

The MLC now has four commands each on the PC and Video (or blank) buttons. When you press an MLC input button repeatedly, the following occurs:

Using the PC button (RGB):

- **First press (memory block 1):** The MLC 52 issues command “A” for RGB 1 input selection. The projector switches to its RGB 1 input.
- **Second press (memory block 2):** The MLC 52 issues command “A” for RGB 2 input selection. The projector switches to its RGB 2 input.
- **Third press (memory block 3):** The MLC 52 issues command “B” for RGB 1 input selection. The projector switches to its RGB 1 input.
- **Fourth press (memory block 4):** The MLC 52 issues command “B” for RGB 2 input selection. The projector switches to its RGB 2 input.

Using the Video button (S-video or composite video):

- **First press (memory block #1):** The MLC 52 issues command “A” for composite video input selection. The projector switches to its video input.
- **Second press (memory block 2):** The MLC 52 issues command “A” for S-video input selection. The projector switches to its S-video input.
- **First press (memory block 1):** The MLC 52 issues command “B” for composite video input selection. The projector switches to its video input.
- **Second press (memory block 2):** The MLC 52 issues command “B” for S-video input selection. The projector switches to its S-video input.

Configuration for a System with a Projector Remote Control Type B (Application 3)

A type B remote control has only two input buttons: one for the RGB inputs and one for the S-video and composite video inputs (see **page 34**). Each of these buttons contains two commands ("A" and "B") that cause the button to toggle between inputs.

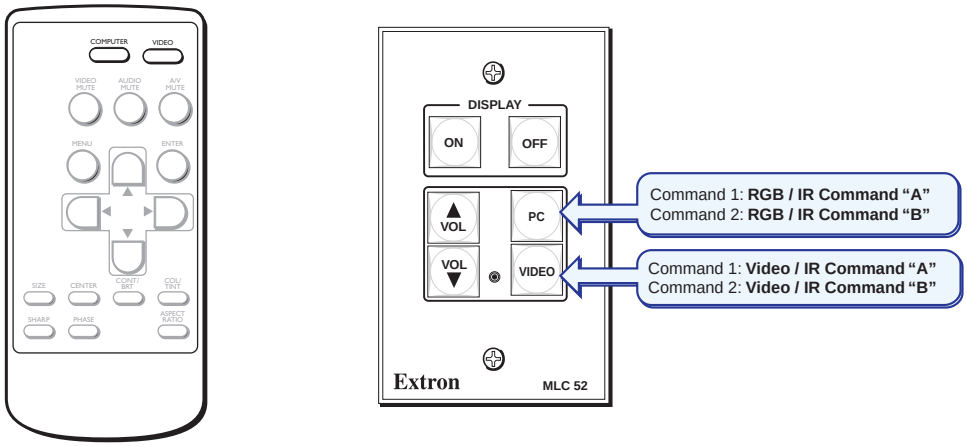
Following these steps, use IR learning to program the input selection commands from the projector type B hand-held remote control onto the MLC PC and Video or blank (VC models) buttons.

Programming RGB inputs — projector remote control type B

1. Place the rear panel configuration DIP switch 1 in the On (up) position to enter learning mode.
2. Using IR learning, program command "A" from the RGB input selection button on the projector remote control into memory block 1 of the MLC 52 PC button as follows:
   a. Press the PC button on the MLC front panel. The button blinks, indicating that the MLC is ready to learn the command. On the rear panel, the bottom IR Learning LED flashes.
   b. Within 5 seconds (while the PC button on the MLC 52 is blinking), press the RGB button on the projector remote control. The MLC learns command "A" for RGB.
3. Program the input selection command "B" from the RGB input selection button on the projector remote control into memory block 2 of the MLC 52 PC button as follows:
   a. Press the PC button on the MLC front panel. The button blinks, indicating that the MLC is ready to learn the command. On the rear panel, the second LED from the bottom flashes.
   b. Within 5 seconds (while the PC button on the MLC 52 is blinking), press the RGB button on the projector remote control. The MLC learns command "B" for RGB.
4. If finished programming the MLC 52 buttons, return configuration DIP switch 1 to its Off (down) position, and test the system.

   If you want to program video input selection at this time, proceed to Programming video inputs — projector remote control type B.

Programming video inputs — projector remote control type B



Projector Remote Type B

Figure 39. Programming MLC 52 Input Selection Buttons from a Projector Remote Control Type B

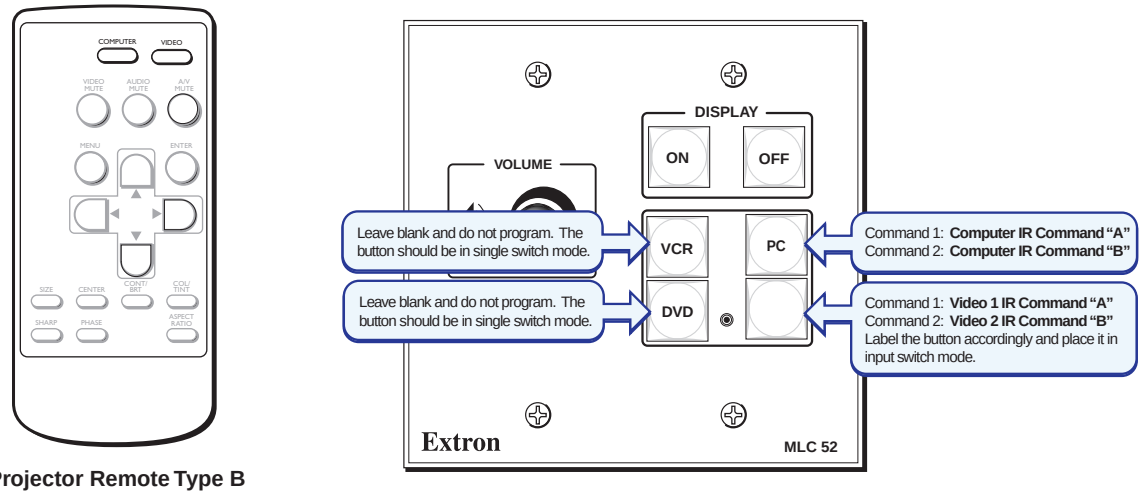


Figure 40. Programming an MLC 52 VC with a Projector Remote Control Type B

1. Place the rear panel configuration DIP switch 1 in the On (up) position to enable learning mode. (If the MLC is already in learning mode, proceed to step 2.)

2. Using IR learning, program command "A" from the Video input selection button on the projector remote control into memory block 1 of the MLC 52 Video or blank (for VC models) button as follows:
   a. Press the Video or blank button on the MLC front panel. The button blinks, indicating that the MLC is ready to learn the command. On the rear panel, the bottom IR learning LED flashes.
   b. Within 5 seconds (while the Video or blank button on the MLC 52 is blinking), press the Video button on the projector remote control. The MLC learns command "A" for video.
3. Program the input selection command "B" from the Video input selection button on the projector remote control into memory block 2 of the MLC 52 Video or blank button as follows:
   a. Press the Video or blank button on the MLC front panel. The button blinks, indicating that the MLC is ready to learn the command. On the rear panel, the second LED from the bottom flashes.
   b. Within 5 seconds (while the Video or blank button on the MLC 52 is blinking), press the Video button on the projector remote control. The MLC learns command "B" for video.
4. When finished programming the MLC 52 buttons, return configuration DIP switch 1 to its Off (down) position.
5. Test the system.

Issuing input selection commands learned from remote control type B

The MLC now has two commands each on the PC and Video (or blank) buttons. When you press an MLC input button repeatedly, the following commands are issued:

Using the PC button (RGB)

- **First press (memory block 1):** The MLC 52 issues command “A” for RGB input selection.
- **Second press (memory block 2):** The MLC 52 issues command “B” for RGB input selection.

Using the Video button (S-video or composite video)

- **First press (memory block 1):** The MLC 52 issues command “A” for composite video input selection.
- **Second press (memory block 2):** The MLC 52 issues command “B” for S-video input selection.

Serial Communication

This section describes the procedure for accessing and starting the MLC 52/DVCM 50 Configuration Program and also contains a list and explanations of the Simple Instruction Set (SIS) commands available for the MLC 52. The following topics are covered:

- **Configuration Ports**
- **Using the MLC 52 Configuration Program**
- **Using SIS Commands**

Configuration Ports

The MLC 52 can be remotely configured via a host computer connected to the front panel configuration port (see **Front Panel Components** on page 28). Through this port, you can program the MLC buttons with commands by using the configuration software (MLC 52/DVCM 50 Configuration Program). You can also issue certain SIS commands through this port.

Using the MLC 52/DVCM 50 Configuration Program

To perform advanced configuration tasks (such as setting button modes, updating firmware, and adding display device drivers), you must use the included MLC 52/DVCM 50 Configuration Program. Many items in the configuration program are also accessible via front panel controls described under **Front Panel Features** on page 27 (see that section for details on features and settings). Some features are available only via this configuration program. The help file provides information on settings and on how to use the configuration program itself.

To install and run the configuration program, ensure that your computer meets the following system requirements:

- Microsoft Windows XP or later
- Pentium III or better processor (or compatible)
- 32 MB free hard disk space
- Microsoft Internet Explorer 4.0 or above
- 4x or higher DVD player
- Minimum 1024x768 screen resolution

The configuration software is provided on a DVD, which is packaged with the MLC. The program can also be downloaded at **www.extron.com**. Install this software on your computer.

Installing the Software from the DVD

To install the MLC 52 configuration software to your computer from the included Extron Software Products DVD:

1. Insert the disc into your computer drive. The DVD should start automatically. If it does not, open your Windows Explorer and double-click **`Launch.exe`** on the DVD drive to start it.
2. On the Extron Software DVD screen, click the **`Software`** button (surrounded by a red box in the illustration below).

Figure 41. Extron Software DVD Screen

3. On the Control Software screen, click the **Install** link at the right of the MLC 52 Series line.

Figure 42. Install Link on Software DVD

4. Follow the directions on the subsequent windows to complete the software installation.

Downloading and Installing the Software from the Website

If you do not have the software on DVD, download it to your computer from the Extron website as follows:

1. Visit the Extron website at **www.extron.com** and select the **Download** tab.

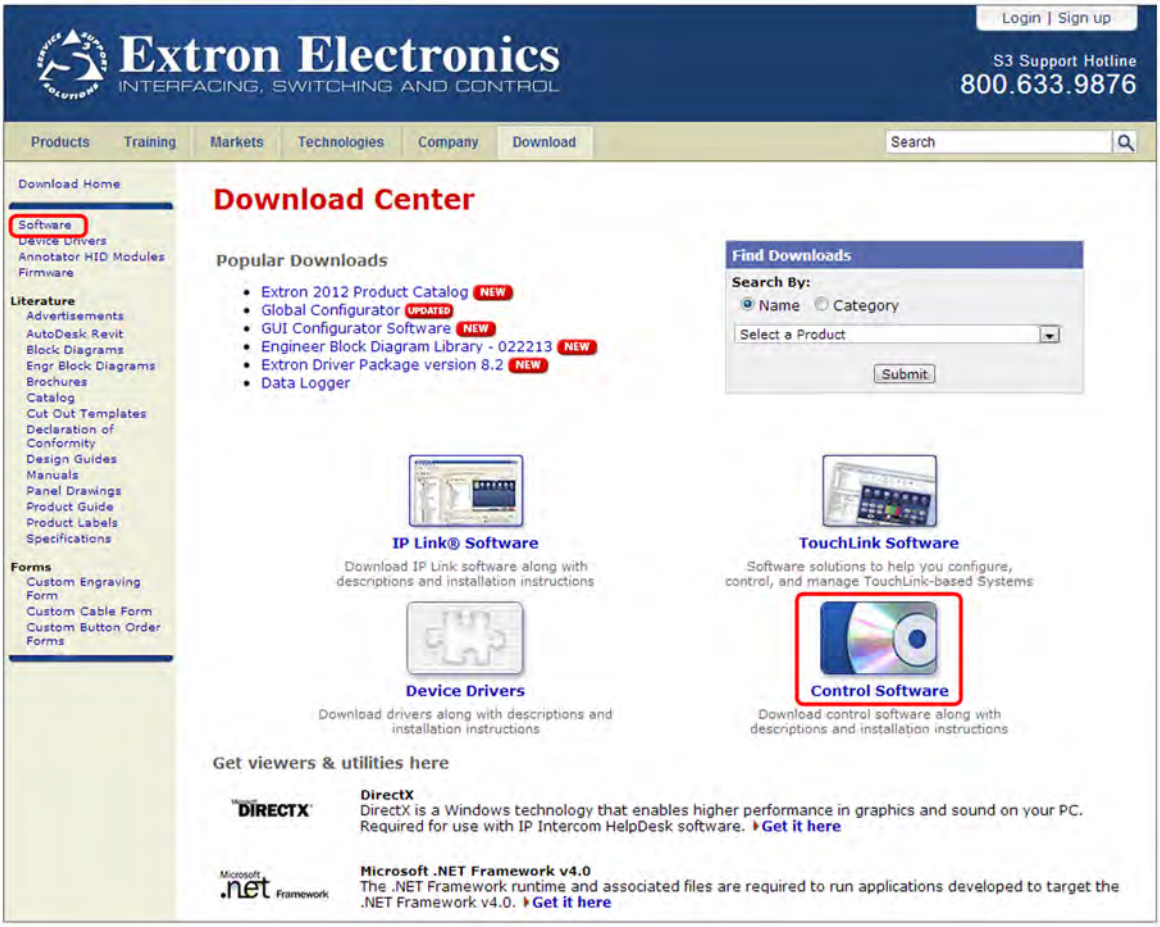


Figure 43. Control Software Button on Download Center Screen

2. On the Download Center screen, click the **Control Software** button. A Control Software screen is displayed, containing a list of control software products.
3. In one of the linked alphabets displayed across the top and bottom of the screen, click **M**.
4. On the "M" software products page, scroll to locate MLC 52, and click the **Download** link at the far right.

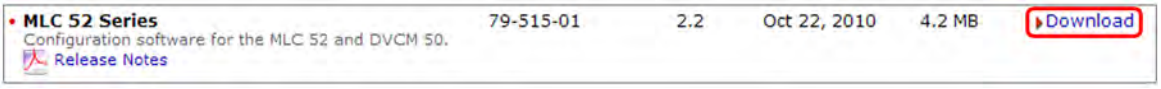


Figure 44. Download Link on the Website for the MLC 52/DVCM 50 Configuration Program

5. On the next screen, fill in the required information.
6. Click the **Download MLC52SW*nxn*.exe** button.
7. Follow the instructions on the download screens to download the software and install it on your computer.

By default the installation creates a MediaLink folder at the following location on your computer hard drive: `C:\Program Files [or Program Files (x86)]\Extron\MediaLink`. The following items are placed in the folder:

- MediaLnk52.exe (MLC 52/DVCM 50 Configuration Program)
- MLC_52_and_DVCM_50_Help.chm (MLC 52 configuration program help file)

Starting the Configuration Program

NOTE: It is not necessary to have an MLC 52 connected and powered up in order to start the configuration program if you start it in emulation mode.

To run the configuration program:

1. On your desktop, click **Start** > **Extron Electronics** > **MLC 52** + **DVCM 50** > **MLC 52** + **DVCM 50 Control Program**.
2. On the Connection Window, select one of the two tabs:
   - **Select a Comm Port** — This tab lets you establish a connection between your computer and the MLC 52. The MLC must be connected to your computer RS-232 port via either the rear panel 6-pole captive screw control connector or the front panel 2.5 mm TRS configuration port.

     From the **Select a COM Port** menu, select the PC communications port through which your MLC is connected to the computer.

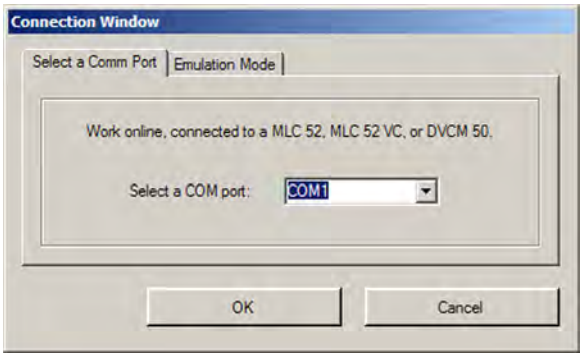


Figure 45. Select a Comm Port Tab

   - **Emulation Mode** — This tab lets you open the software whether or not an MLC 52 is attached to the computer.

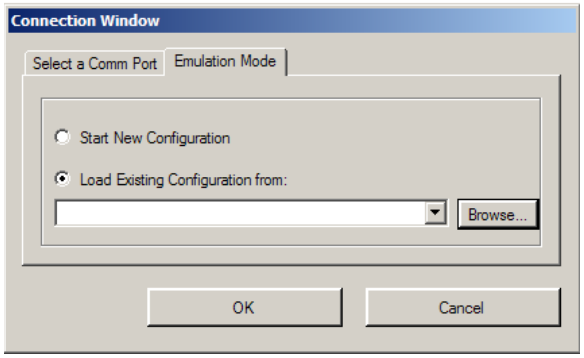


Figure 46. Emulation Mode Tab

3. On the **Select a Comm Port** tab, select a COM port from the drop-down menu,

   or

   On the **Emulation Mode** tab, select one of the following radio buttons:

   - **Start New Configuration** to create a new configuration in emulation mode
   - **Load existing configuration from** to open an existing configuration. If you select this radio button, do the following:

     a. Click the **Browse** button.

     b. In the Import configuration from... window, locate the configuration file that you want to open in emulation mode (configuration files have a `.mlk` ending) and double-click on it.

     The path to the selected configuration is displayed in the **Browse** field on the Connection window.

     See the MLC 52/DVCM 50 Configuration Program help file for information on using emulation mode.

4. Click **OK**. The MLC 52/DVCM 50 Configuration Program window opens.

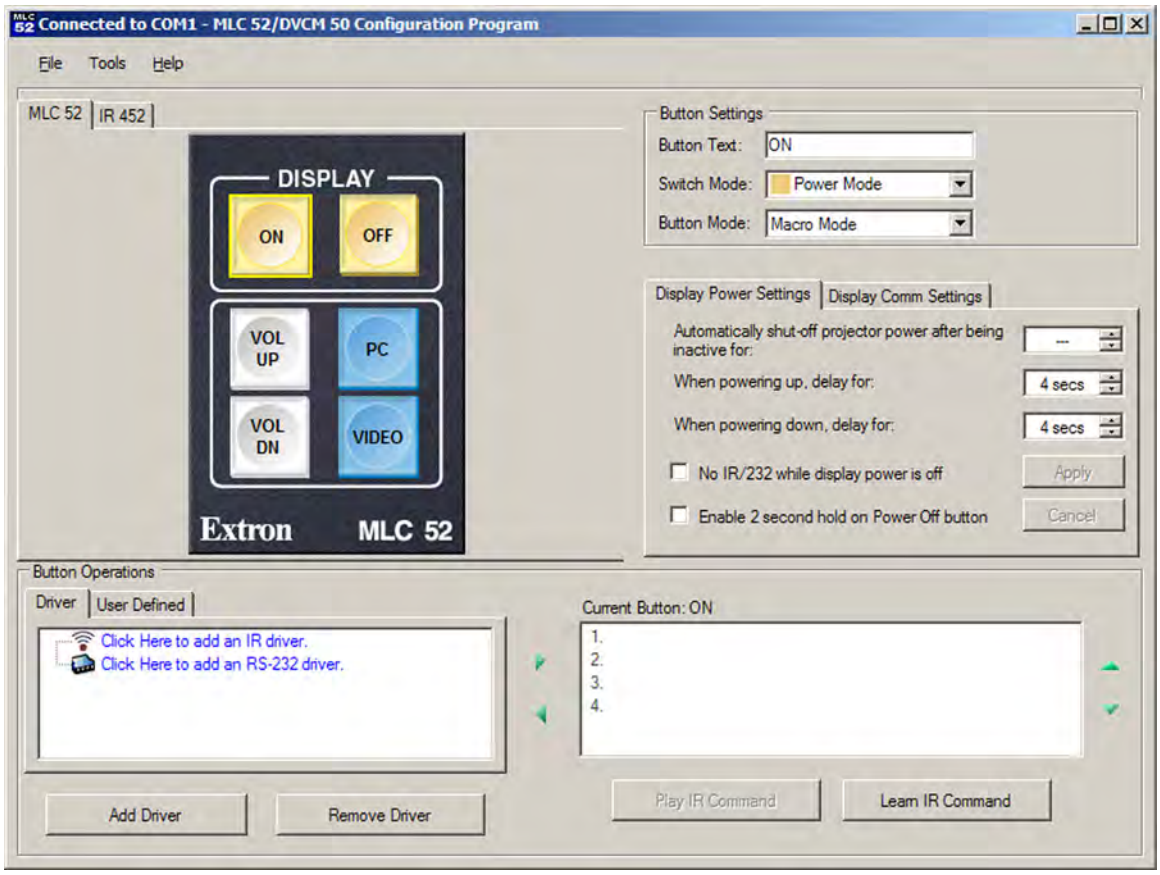


Figure 47. MLC 52/DVCM 50 Configuration Program Window

For an explanation of all procedures for creating MLC 52 configurations, see the configuration program help file. To access the help, select **Contents** from the **Help** menu on the MLC 52 window, or press <F1> and navigate to the relevant section.

Loading Extron Drivers

Extron drivers are control files (libraries) of Extron-created projector or display commands that are specific to a particular display device. There are different sets of drivers for serial (RS-232) and for IR control.

Before you can use the software to configure the MLC buttons, the IR, serial, or both driver packages must be loaded onto your computer. You must then load the driver for your display device to the MLC in order to configure the MLC to control the device.

NOTES:

- The MLC 52 is compatible with IP Link IR® drivers found in the IPL Driver Package, version 6 or higher.
- Use preconfigured control files (drivers) whenever possible. If no driver is available for the display that you want to control, it is possible to create your own driver via IR Learning (see **Configuring Using IR Learning** on page 18) or using the MLC 52 configuration program (see the configuration program help file).

ATTENTION: Loading a new driver causes the existing configuration on the MLC to be overwritten. If you know that you will want to use the previous configuration again, be sure to save it when the screen prompts you.

Loading the serial (RS-232) drivers

When you install your MLC 52 configuration software, by default the installation program loads the Extron serial drivers in the Driver2 folder on your computer at the following location, unless you specify otherwise:

- **Windows XP** — `C:\Documents and Settings\All Users\Shared Documents\Extron\Driver2`
- **Windows 7** — `C:\Users\Public\Documents\Extron\Driver2`

RS-232 drivers must be loaded or selected before you can choose RS-232 commands to program the buttons (see the MLC 52 configuration program help file for more information).

Downloading IR drivers from the DVD

The software DVD provided with the MLC 52 contains a set of device drivers that are also available from the website. To load the drivers from the DVD to your computer:

1. Load the Extron Software Products DVD into your CD or DVD drive. The disc should start automatically. If it does not, open Windows Explorer and double-click **Launch.exe** on the CD or DVD drive to start it.
2. On the opening screen, click the **Drivers** button or select the **Drivers** tab at the top of the screen.
3. On the Drivers screen, select **MLC 52/DVCM 50 Device Drivers**.

Figure 48. Selecting the MLC 52/DVCM 50 IR Driver Package

The IR device drivers package list screen is displayed.

4. From the DVD, you can download either the current Extron driver package (containing all IR drivers that were available at the time the package was compiled) or one driver at a time.

   To download the driver package:

   a. Click **`Download install for current driver package (n.n MB)`**.

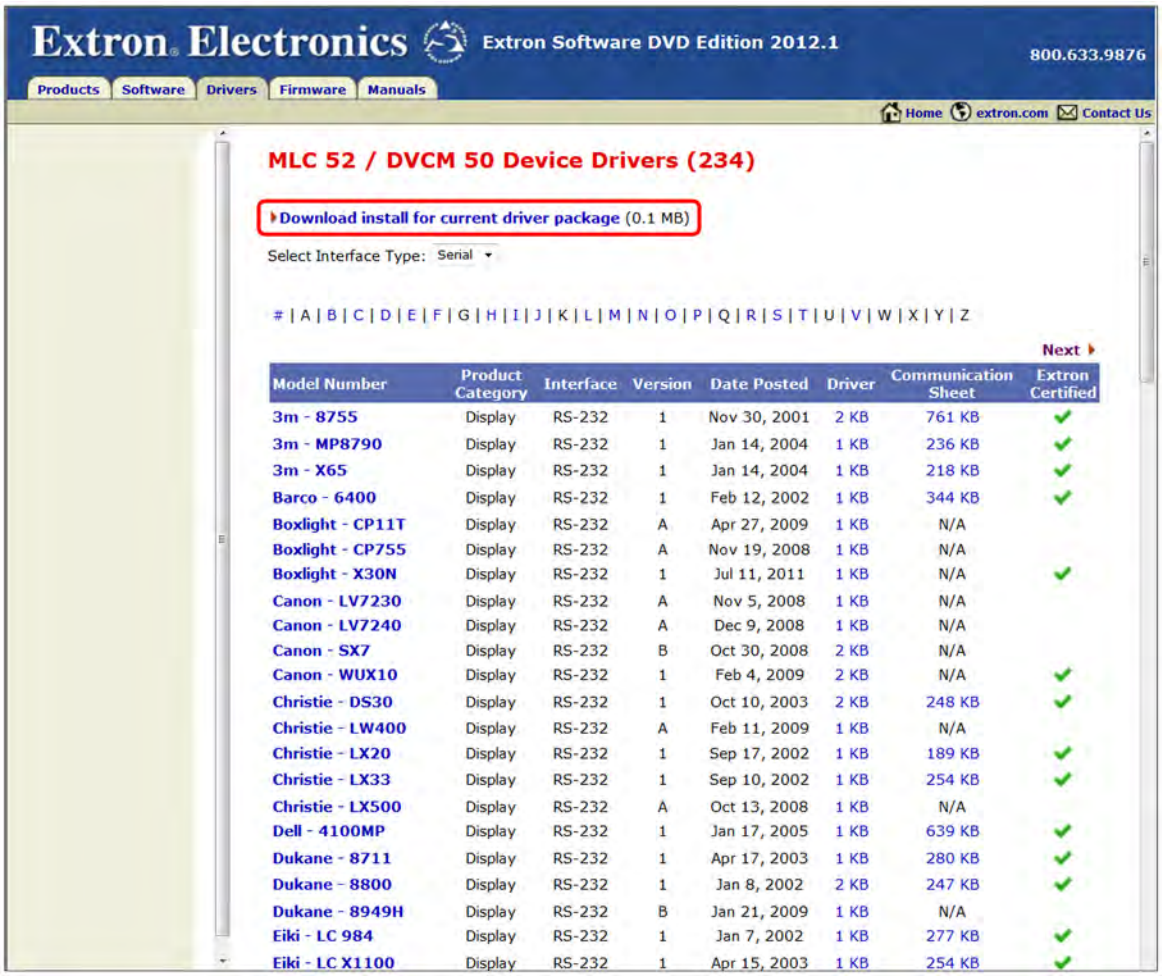


Figure 49. IR Device Drivers Package List

   b. Click **`Run`** on the File Download - Security Warning screen.

   c. Click **`Run`** on the browser Security Warning screen.

   d. Follow instructions on the Driver Install wizard screens to complete installation of the driver package. The drivers are all placed in the Driver2 folder.

NOTE: By default,the drivers that you download are stored in the Driver2 folder on your computer, located at:

- **Windows XP** — `C:\Documents and Settings\All Users\Shared Documents\Extron\Driver2`
- **Windows 7** — `C:\Users\Public\Public Documents\Extron\Driver2`

To download a single driver:

a. (Optional) From the Select Interface Type drop-down menu, select **IR** for the type of drivers to view. When you make this selection, only drivers in the current driver package are displayed.

b. If you want to view all the IR drivers, including those outside the current package, click **View All.**

c. To view additional pages of driver listings, click **Next**. Click **Previous** to page backward through the drivers list.

d. Right-click on the name of the desired driver. From the pop-up menu, select **Save Target As...** .

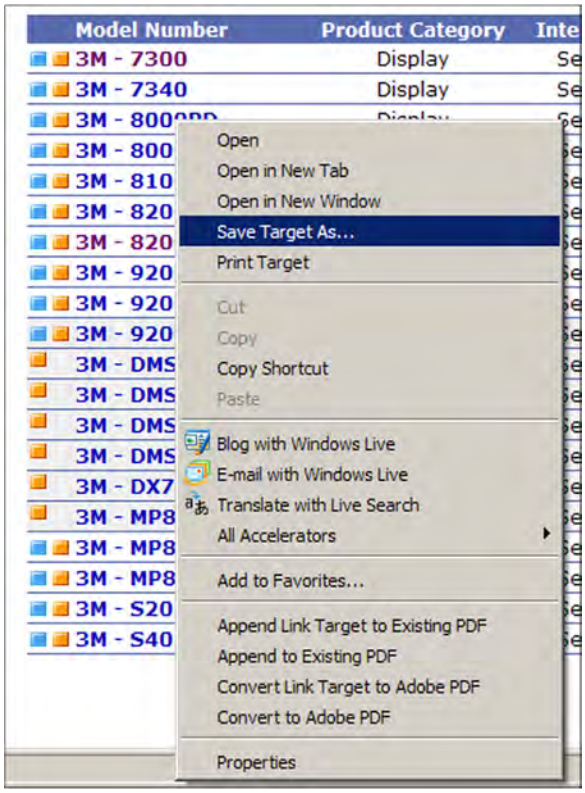


Figure 50. Saving a Single Driver to the Computer

e. On the Save window that opens, save the driver file in the Driver2 folder as follows:

- **Windows XP** — `c:\Documents and Settings\All Users\Shared Documents\Extron\Driver2`
- **Windows 7** — `c:\Users\Public\Public Documents\Extron\Driver2`

Downloading drivers from the website

Drivers can also be obtained directly from the Extron website, as follows:

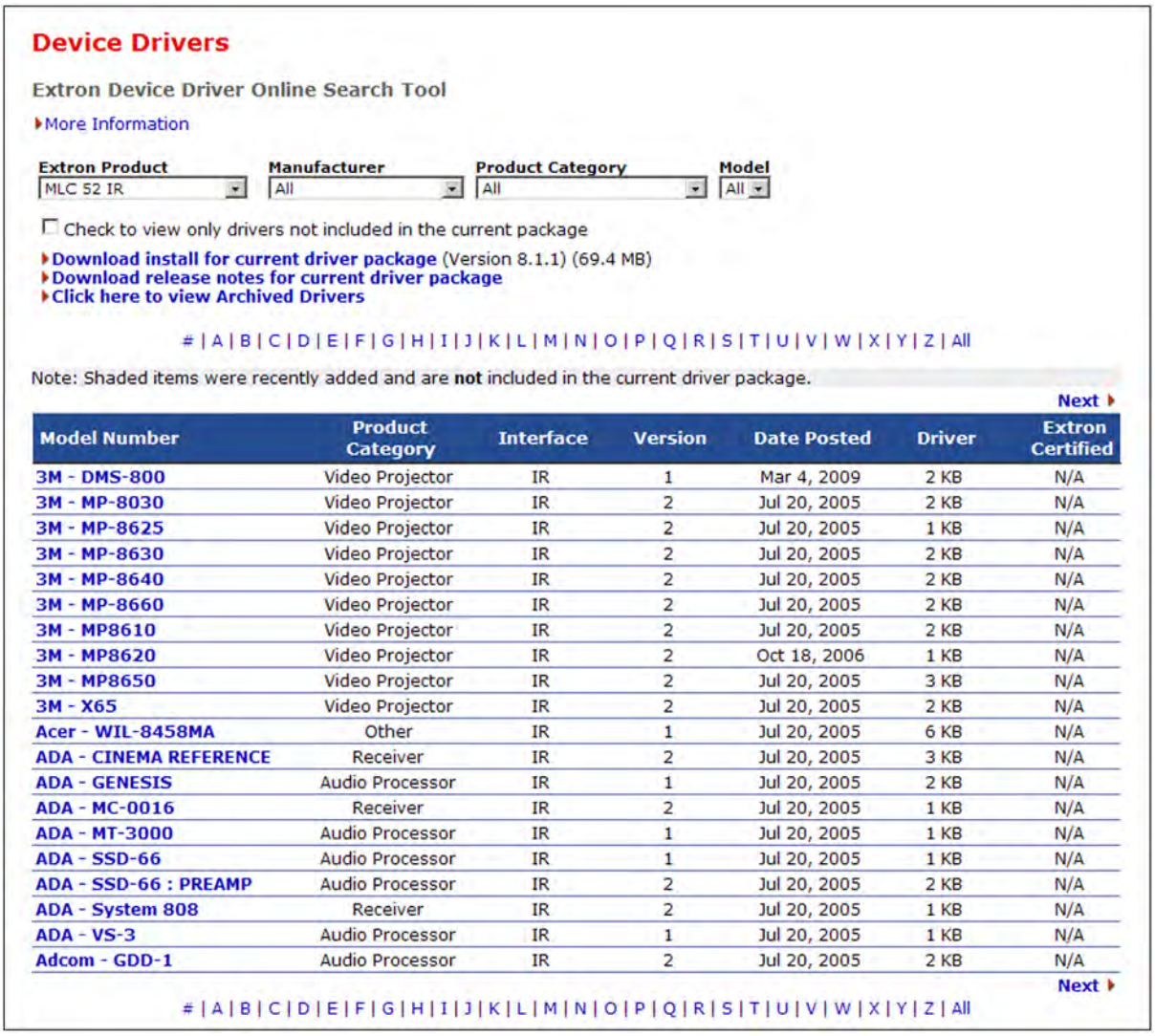
1. Visit the Extron website at **www.extron.com**, and click the **Download** tab.
2. Click the **Device Drivers** button (shown at right) on the Download Center screen.

3. From the drop-down menu on the Device Drivers screen, select **MLC 52 IR**.

Figure 51. Device Drivers Screen

4. From the menus on the Extron Device Drivers Online Search Tool screen, select search criteria for the drivers you want to download. You can select the Extron Product on which the drivers will be used (**MLC 52 IR** or **MLC 52 RS** is already selected), the Protocol Type (**IR**, **Serial**, or **All**), Manufacturer (device manufacturer name or **All**), Product Category (type of device or **All**), and Model (model name or **All**).

As you make each selection, the driver list below changes to display all available drivers meeting your selected criteria.



Device Drivers

Extron Device Driver Online Search Tool

More Information

Extron Product: MLC 52 IR | Manufacturer: All | Product Category: All | Model: All

Check to view only drivers not included in the current package

Download install for current driver package (Version 8.1.1) (69.4 MB)
Download release notes for current driver package
Click here to view Archived Drivers

| A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | All

Note: Shaded items were recently added and are **not** included in the current driver package.

Next

Model Number	Product Category	Interface	Version	Date Posted	Driver	Extron Certified
3M - DMS-800	Video Projector	IR	1	Mar 4, 2009	2 KB	N/A
3M - MP-8030	Video Projector	IR	2	Jul 20, 2005	2 KB	N/A
3M - MP-8625	Video Projector	IR	2	Jul 20, 2005	1 KB	N/A
3M - MP-8630	Video Projector	IR	2	Jul 20, 2005	2 KB	N/A
3M - MP-8640	Video Projector	IR	2	Jul 20, 2005	2 KB	N/A
3M - MP-8660	Video Projector	IR	2	Jul 20, 2005	2 KB	N/A
3M - MP8610	Video Projector	IR	2	Jul 20, 2005	2 KB	N/A
3M - MP8620	Video Projector	IR	2	Oct 18, 2006	1 KB	N/A
3M - MP8650	Video Projector	IR	2	Jul 20, 2005	3 KB	N/A
3M - X65	Video Projector	IR	2	Jul 20, 2005	2 KB	N/A
Acer - WIL-8458MA	Other	IR	1	Jul 20, 2005	6 KB	N/A
ADA - CINEMA REFERENCE	Receiver	IR	2	Jul 20, 2005	3 KB	N/A
ADA - GENESIS	Audio Processor	IR	1	Jul 20, 2005	2 KB	N/A
ADA - MC-0016	Receiver	IR	2	Jul 20, 2005	1 KB	N/A
ADA - MT-3000	Audio Processor	IR	1	Jul 20, 2005	1 KB	N/A
ADA - SSD-66	Audio Processor	IR	1	Jul 20, 2005	1 KB	N/A
ADA - SSD-66 : PREAMP	Audio Processor	IR	2	Jul 20, 2005	2 KB	N/A
ADA - System 808	Receiver	IR	2	Jul 20, 2005	1 KB	N/A
ADA - VS-3	Audio Processor	IR	1	Jul 20, 2005	1 KB	N/A
Adcom - GDD-1	Audio Processor	IR	2	Jul 20, 2005	2 KB	N/A

Next

| A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | All

Figure 52. Entering MLC 62 Driver Search Criteria

5. Click on the device name whose driver you want to download.

   To download all the drivers in the current package, click the **`Download install for current driver package (Version n)`** link.

6. On the Download Center screen, enter the requested information, and click the **`Download driver name`** button.

7. Follow the directions on the download screens that follow. Unless you specify otherwise, the driver file is placed at one of the following locations on your computer:

   - **Windows XP** — `C:\Documents and Settings\All Users\Shared Documents\Extron\Driver2`
   - **Windows 7** — `C:\Users\Public\Documents\Extron\Driver2`

Using SIS Commands

Simple Instruction Set (SIS) commands can be entered on your computer, using a utility such as Extron DataViewer or HyperTerminal, to find out more information about the MLC 52, to toggle display power or front panel lock state, or to reset the unit.

Host-to-Controller Communications

SIS commands consist of strings of one or more characters per field. No special characters are required to begin or end a command sequence. When the MLC determines that a command is valid, it executes the command and sends a response to the host device.

Most responses from the MLC 52 to the host end with a carriage return and a line feed (CR/LF = ↵), which signals the end of the response character string.

Controller-initiated messages

When a local event such as a front panel button press takes place, the MLC 52 responds by sending a message to the host, indicating what selection was entered. No response is required from the host.

The MLC sends the following copyright message only when it first powers on.

`(c) Copyright 20nn, Extron Electronics, MLC 52, Vn.nn, 60-100n-nn`

where V*n.nn* is the firmware version number and 60-100*n-nn* is the MLC 52 model number.

Error Responses

If the MLC 52 is unable to execute a command it receives because the command is invalid or contains invalid parameters, the controller returns an error response to the host. This response consists of the letter "E" followed by a number and a carriage return with a line feed. The following error response codes can be returned:

`E10` – Invalid command or parameter

`E14` – Not valid for this configuration

Using the Command and Response Table

The command and response table on the following pages lists valid ASCII command codes, the responses of the MLC to the host, and a description of the command function or the results of executing the command. The ASCII to Hex Conversion Table below is for use with the command and response table.

Space →

ASCII to Hex Conversion Table																															
	20	!	21	"	22	#	23	$	24	%	25	&	26	'	27	(	28	)	29	*	2A	+	2B	,	2C	-	2D	.	2E	/	2F
0	30	1	31	2	32	3	33	4	34	5	35	6	36	7	37	8	38	9	39	:	3A	;	3B	<	3C	=	3D	>	3E	?	3F
@	40	A	41	B	42	C	43	D	44	E	45	F	46	G	47	H	48	I	49	J	4A	K	4B	L	4C	M	4D	N	4E	O	4F
P	50	Q	51	R	52	S	53	T	54	U	55	V	56	W	57	X	58	Y	59	Z	5A	[	5B	\	5C	]	5D	^	5E	_	5F
`	60	a	61	b	62	c	63	d	64	e	65	f	66	g	67	h	68	i	69	j	6A	k	6B	l	6C	m	6D	n	6E	o	6F
p	70	q	71	r	72	s	73	t	74	u	75	v	76	w	77	x	78	y	79	z	7A	{	7B	|	7C	}	7D	~	7E	DEL	7F

Esc 1B CR 0D LF 0A

Symbol Definitions

↵ = CR/LF (carriage return/line feed) (hex ØD ØA)

← = Soft carriage return (no line feed) (hex ØD; web |)

• = Space

Esc = Escape key (hex 1B; web W)

X1 = Firmware version number (*n.nn* format)

X2 = Display power status (Ø through 3)
- Ø = power off
- 1 = power on
- 2 = cooling down
- 3 = warming up

X3 = Front panel lock status
- Ø = unlocked
- 1 = locked

NOTE: Unless otherwise indicated, commands are not case-sensitive.

Command and Response Table for SIS Commands

Command	ASCII Command (Host to Unit)	Response (Unit to Host)	Additional Description
Information Requests			
Query firmware version	Q	X1↵	Display firmware version X1 to two decimal places (*n.nn*).
Example:	Q	1.ØØ↵	
View controller part number	N	6Ø-74*n*-*nn*↵	Show the MLC 52 part number: MLC 52 IR = 60-744-02 MLC 52 RS = 60-744-12 MLC 52 IR VC = 60-745-02 MLC 52 RS VC = 60-745-12 MLC 52 RS MK = 60-744-23 MLC 52 RS EU = 60-744-34 MLC 52 RS MK VC = 60-745-23 MLC 52 RS EU VC = 60-745-34
Query model name	I	MLC•52•IR↵ or MLC•52•RS↵ or MLC•52•IR•VC↵ or MLC•52•RS•VC↵ or MLC•52•RS•EU↵ or MLC•52•RS•MK↵ or MLC•52•RS•EU•VC↵ or MLC•52•RS•MK•VC↵	Show the name of the MLC 52 model.
Display Power Status			
Turn display power on	1P	Pwr1↵	
Turn display power off	ØP	PwrØ↵	
View display power status	P	PwrX2↵	For X2: Ø = on 1 = off 2 = cooling down 3 = warming up
Example:	P	Pwr2↵	The projector or display is cooling down.
Front Panel Lockout (Executive Mode)			
Off	ØX	ExeØ↵	Unlock front panel buttons.
On	1X	Exe1↵	Lock all front panel buttons.
View	X	X3↵	View front panel lockout status X3. For X3: Ø = unlocked; 1 = locked.
Reset			
Reset unit to factory defaults	Esc ZXXX↵	ZapX↵	Reset all MLC 52 buttons and switches to the factory default and erase any codes added by the user.

Reference Information

This section contains the names and part numbers of included parts and optional accessories for all models of the MLC 52. It also contains instructions for mounting an electrical junction box and templates for measuring and cutting the hole in the mounting surface (US models only).

Topics include:

- **Part Numbers and Accessories**
- **Mounting an Electrical Box**
- **Templates for the MLC 52 and MLC 52 VC (US Models)**

Part Numbers and Accessories

Included Parts

These items are included with the MLC 52 Series controller:

Included Parts	Replacement Part Number
MLC 52 IR	60-744-02
MLC 52 RS	60-744-12
MLC 52 RS VC	60-745-12
MLC 52 RS MK (white, brushed aluminum)	60-744-23, -24
MLC 52 RS EU (white, brushed aluminum)	60-744-34, -35
MLC 52 RS VC MK	60-745-23
MLC 52 RS VC EU	60-745-35
One-gang plastic mounting bracket (mud ring) (black, white)	70-519-12, -13
Two-gang plastic mounting bracket (mud ring) (black, white)	70-519-22, -23
Button labels — icon and text	33-1762-01
IR Emitter with cable (MLC 52 IR and IR VC only)	70-283-01
PS 1210 C 12 VDC, 1 A external power supply	70-775-01
ESD grounding card and cable kit	
6-pole, 3.5 mm captive screw connector	101-007-01
Replacement button caps and diffusers (3)	70-352-01
MLC 52 Series MediaLink Controllers Quick Start Guide	
Extron Software Products DVD	

Optional Accessories

These optional items can be ordered separately:

Mounting Hardware	Part Number
EWB 101 one-gang external wall box (black, white)	60-1161-02, -03
JB 125 one-gang junction box, 2.5" (10 mm) deep	980130
SMB 101 one-gang surface mount box (black only)	60-1292-02
EWB 102 two-gang external wall box (black, white)	60-1162-02, -03
JB 225 two-gang junction box, 2.5" (10.2 mm) deep	980084
JB 235 two-gang junction box, 3.5" (14.3) deep	980057
SMB 102 two-gang surface mount box (black only)	60-1293-02
MR 100 one-gang plastic modular mounting bracket (mud ring) (1 black, 1 white) (US only)	70-519-12, -13
MR 200 two-gang plastic modular mounting bracket (mud ring) (1 black, 1 white) (US only)	70-519-22, 23

Faceplates	Part Number
MLM 52 1GWP (black, white)	70-498-02
MLM 52 VC (black, white)	70-527-02

Miscellaneous Accessories	Part Number
MPA 152 Stereo Power Amplifier	60-844-01
MPA 152 Stereo Power Amplifier, ENERGY STAR qualified	60-844-02
MPA 401-70 Mono 70 V Power Amplifier	60-845-01
MPA 401-100 Mono 100 V Power Amplifier	60-845-11
IRL 20	60-580-01
VC 50 Volume Control Wallplate	70-530-02
CFG 9-pin D female to 2.5 mm TRS Configuration Cable	70-335-01

Recommended Cables

CTL and CTLP (Comm-link) Cable	Part Number
CTL/1000 bulk 1000'/300 m, non-plenum	22-148-03
CTLP/1000 bulk 1000'/300 m, plenum	22-119-03

Mounting an Electrical Box

If you want to install the MLC 52 or MLC 52 VC (US models) in an electrical box (in a wall or in furniture), install the box as described below.

NOTE: These instructions are for US models only. To mount an electrical box for an EU or MK model, follow the directions provided with the box by its manufacturer.

1. See the appropriate template diagram in **Templates for MLC 52 and MLC 52 VC (US Models)** on page 64, to find out the dimensions of the opening required for the size of the wall box or mud ring that you are using.
2. Using a ruler or tape measure and a soft pencil, draw guidelines on the installation surface (wall or furniture) in the desired orientation and location where the opening for the bracket or wall box will be cut.

   ATTENTION: The template diagrams in this guide are not to scale. Do not trace them or use them as patterns on the installation surface. Use these diagrams only for reference to obtain the dimensions of the hole that needs to be cut. Use a ruler to measure and draw the cutting guidelines.

3. Cut out the wall or furniture material inside the marked area.
4. Check the opening size by inserting the wall box or mounting bracket into the opening. The equipment should fit easily into the opening. Enlarge or smooth the edges of the opening if needed.
5. Feed cables through the electrical box punch-out holes, and secure them with cable clamps to provide strain relief.
6. Ground the electrical box.
7. Exposed cable shields (braided or foil) are potential sources of short circuits. Trim back or insulate shields with heat shrink.

   CAUTION: To prevent short circuits, cut back the outer foil shield to the point where the cable exits the cable clamp. Both braided and foil shields should be connected to an equipment ground at the other end of the cable.

8. Insert the electrical box into the opening, and attach it to the wall stud or furniture with nails or screws, leaving the front edge flush with the outer wall or furniture surface. The following illustration applies to all sizes of electrical boxes.

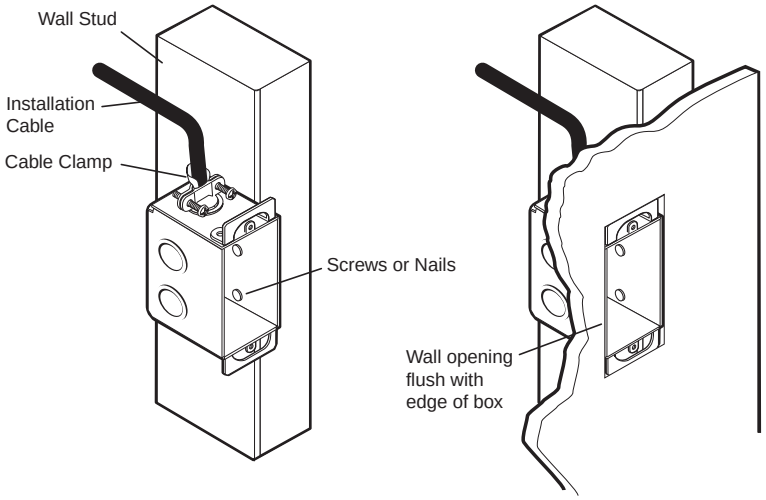


Figure 53. Attaching an Electrical Box to a Wall Stud

- If you are attaching the wall box to wood, use four #8 or #10 screws or 10-penny nails. A minimum of ½ inch (1.3 cm) of screw threads must penetrate the wood.
- If you are attaching the wall box to metal studs or furniture, use four #8 or #10 self-tapping sheet metal screws or machine bolts with matching nuts.
- If you are using a mounting bracket (mud ring) with the electrical box, see **Mounting the MLC to a Decora Mounting Bracket** on page 25 to attach the clips that fasten the bracket to the wall or furniture.

9. Ground the MLC to the electrical box as follows:
   a. Attach the bare wire end of the provided grounding wire to the Gnd pin of the 6-pole captive screw connector on the MLC rear panel.
   b. Attach the other end of the grounding wire to a screw on the junction box.
10. If desired, replace the faceplate or button labels on the MLC (see **Replacing the Faceplate (US Models Only)** on page 9 or **Replacing Button Labels** on page 10).
11. Cable and test the MLC before fastening it into the wall box, mounting bracket, or furniture.

Templates for MLC 52 and MLC 52 VC (US Models)

Use these rough-in templates as guides to measure and mark the hole in the wall or furniture through which the MLC 52 will be mounted. The templates provide measurements for installing the controller with either an electrical box or a mounting bracket. You do not need the templates if you are mounting the panel using an external mounting option.

NOTES:

- These templates are for US models only.
- These templates are **not** to scale and are provided for reference only.

The MLC controller requires a depth of at least 1.25 inches (3.2 cm) inside the wall or furniture.

MLC 52 IR and MLC 52 RS Cutout Template for the One-gang Decora Mud Ring

To mount the MLC 52 to a one-gang plastic Decora mud ring, use the dimensions shown below to cut the hole in the mounting surface.

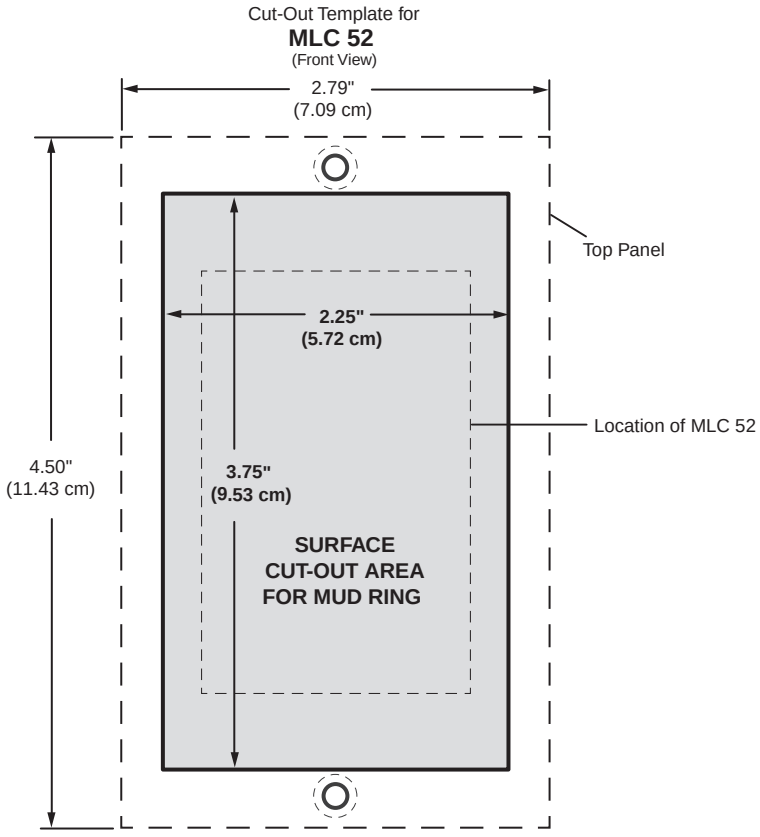


Figure 54. MLC 52 IR and MLC 52 RS Cutout Template for the One-gang Decora Mud Ring

MLC 52 IR VC and MLC 52 RS VC Cutout Template for the Two-gang Decora Mud Ring

To mount the MLC 52 VC to a two-gang plastic Decora mud ring, use the dimensions shown below to cut the hole in the mounting surface.

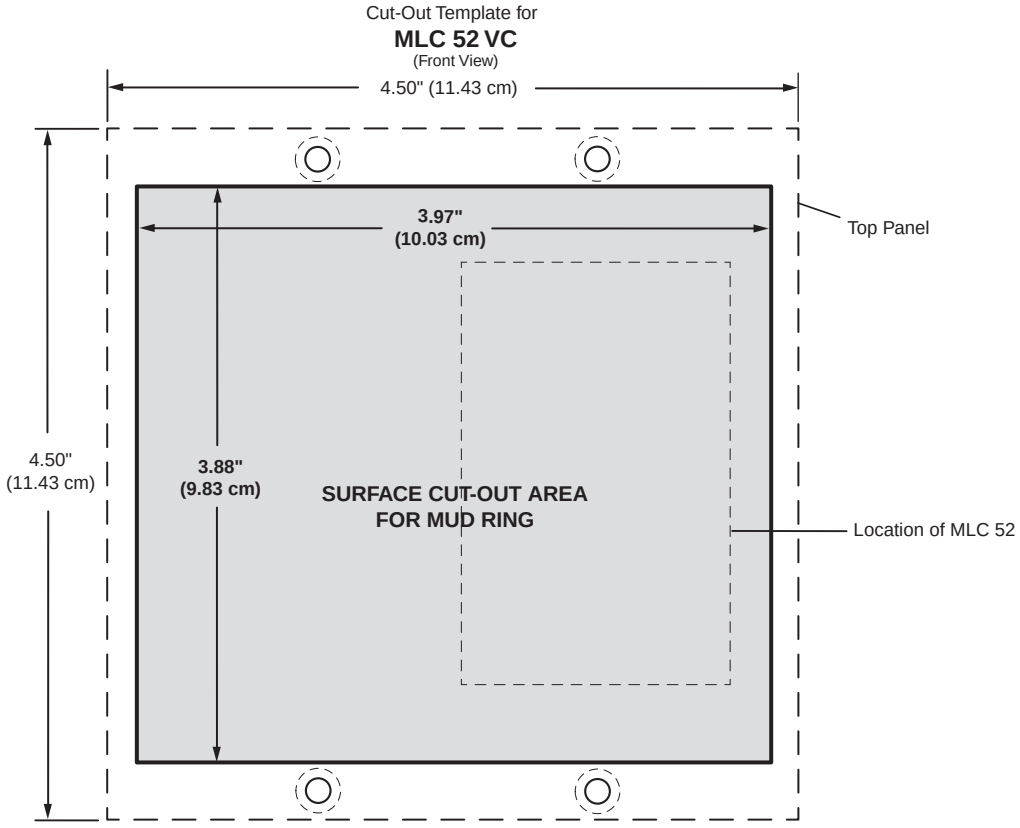


Figure 55. MLC 52 IR VC and MLC 52 RS VC Cutout Template for the Two-gang Decora Mud Ring

MLC 52 IR and MLC 52 RS Cutout Template for Mounting Directly to a Wall or Furniture

To mount the MLC 52 RS or IR directly to a wall or furniture, use the dimensions shown below to cut the hole in the mounting surface.

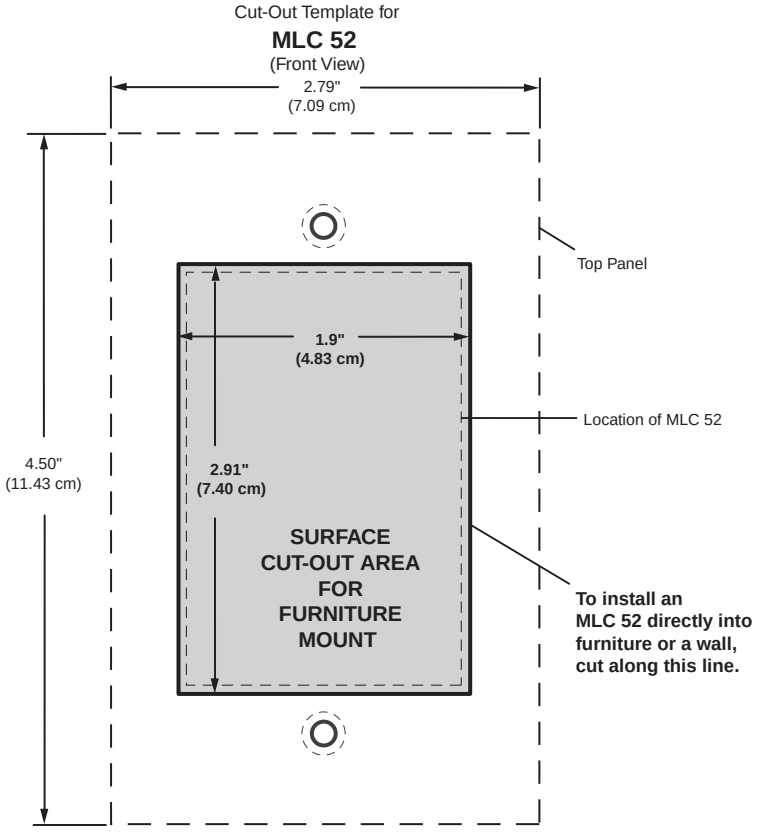


Figure 56. Cutout Template for Mounting an MLC 52 IR or MLC 52 RS Directly to a Wall or Furniture

MLC 52 IR VC and MLC 52 RS VC Cutout Template for Mounting Directly to a Wall or Furniture

To mount the MLC 52 RS VC or MLC 52 IR VC directly to a wall or furniture, use the dimensions shown below to cut the hole in the mounting surface.

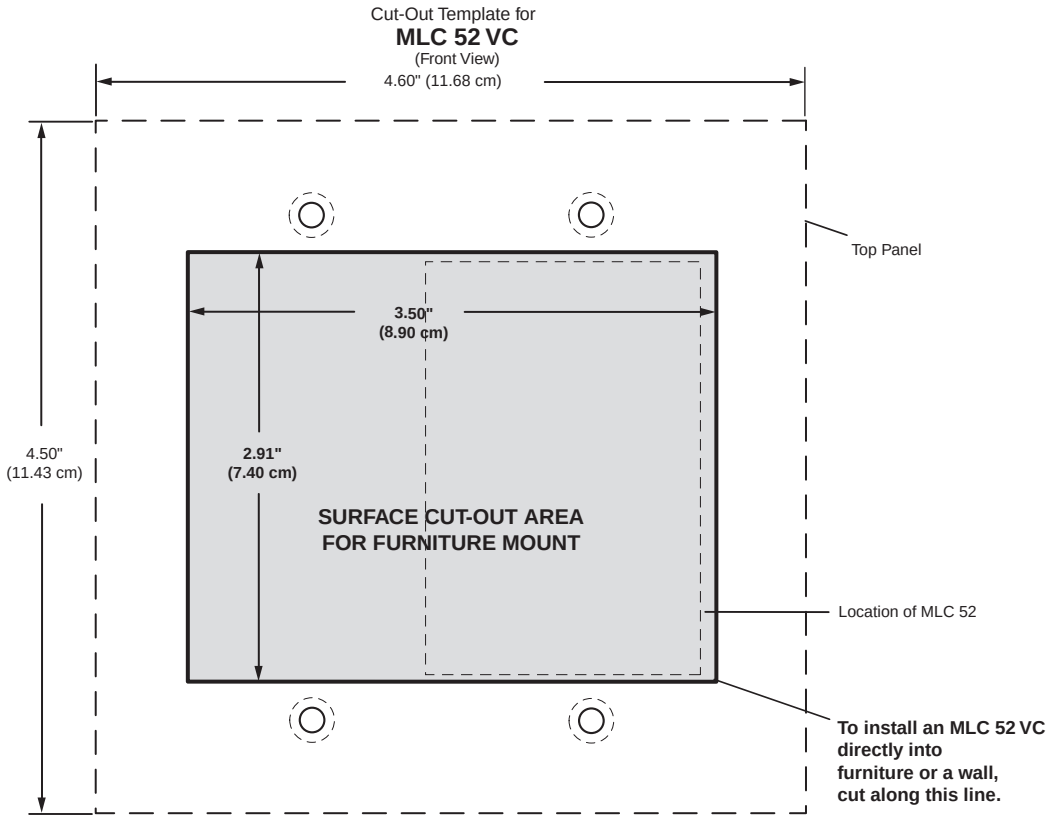


Figure 57. Cutout Template for Mounting an MLC 52 IR VC or MLC 52 RS VC Directly to a Wall or Furniture

Extron Warranty

Extron Electronics warrants this product against defects in materials and workmanship for a period of three years from the date of purchase. In the event of malfunction during the warranty period attributable directly to faulty workmanship and/or materials, Extron Electronics will, at its option, repair or replace said products or components, to whatever extent it shall deem necessary to restore said product to proper operating condition, provided that it is returned within the warranty period, with proof of purchase and description of malfunction to:

USA, Canada, South America, and Central America:
Extron Electronics
1230 South Lewis Street
Anaheim, CA 92805
U.S.A.

Japan:
Extron Electronics, Japan
Kyodo Building, 16 Ichibancho
Chiyoda-ku, Tokyo 102-0082
Japan

Europe and Africa:
Extron Europe
Hanzeboulevard 10
3825 PH Amersfoort
The Netherlands

China:
Extron China
686 Ronghua Road
Songjiang District
Shanghai 201611
China

Asia:
Extron Asia
135 Joo Seng Road, #04-01
PM Industrial Bldg.
Singapore 368363
Singapore

Middle East:
Extron Middle East
Dubai Airport Free Zone
F12, PO Box 293666
United Arab Emirates, Dubai

This Limited Warranty does not apply if the fault has been caused by misuse, improper handling care, electrical or mechanical abuse, abnormal operating conditions, or if modifications were made to the product that were not authorized by Extron.

NOTE: If a product is defective, please call Extron and ask for an Application Engineer to receive an RA (Return Authorization) number. This will begin the repair process.

USA: 714.491.1500 or 800.633.9876
Asia: 65.6383.4400
Europe: 31.33.453.4040
Japan: 81.3.3511.7655

Units must be returned insured, with shipping charges prepaid. If not insured, you assume the risk of loss or damage during shipment. Returned units must include the serial number and a description of the problem, as well as the name of the person to contact in case there are any questions.

Extron Electronics makes no further warranties either expressed or implied with respect to the product and its quality, performance, merchantability, or fitness for any particular use. In no event will Extron Electronics be liable for direct, indirect, or consequential damages resulting from any defect in this product even if Extron Electronics has been advised of such damage.

Please note that laws vary from state to state and country to country, and that some provisions of this warranty may not apply to you.

Extron Headquarters
+1.800.633.9876 (Inside USA/Canada Only)
Extron USA - West
+1.714.491.1500
+1.714.491.1517 FAX
Extron USA - East
+1.919.850.1000
+1.919.850.1001 FAX

Extron Europe
+800.3987.6673
(Inside Europe Only)
+31.33.453.4040
+31.33.453.4050 FAX

Extron Asia
800.3987.6673
(Inside Asia Only)
+65.6383.4400
+65.6383.4664 FAX

Extron Japan
+81.3.3511.7655
+81.3.3511.7656 FAX

Extron China
+4000. 398766
(Insidse China Only)
+86.21.3760.1568
+86.21.3760.1566 FAX

Extron Middle East
+971.4.299.1800
+971.4.299.1880 FAX

Extron Korea
+82.2.3444.1571
+82.2.3444.1575 FAX

Extron India
1800.3070.3777
(Inside India Only)
+91.80.3055.3777
+91.80.3055.3737 FAX