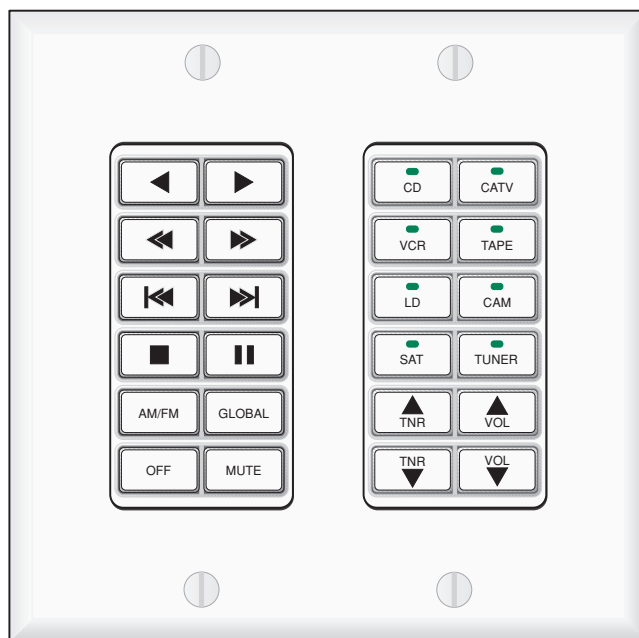


INSTALLATION INSTRUCTIONS

SMARTPAD₃[™] PROGRAMMABLE KEYPAD SYSTEM



INTRODUCTION

The SmartPad₃ is the next generation of the SmartPad₂, the world's first wall mounted, IR learning, programmable modular keypad system. It incorporates many unique features to accommodate the growing needs of the fast moving custom installation marketplace.

UNIQUE FEATURES

- **Eight different Key Modules** are provided which dock into **three different Base Modules**. Over 50 keypad combinations are possible!
- **One, two and three gang** wall mounting options are available.
- **Buttons are replaceable and interchangeable** within the key module.
- **A selection of buttons** with commonly used markings **are included** with each key module. Many specialized versions are also separately available from Xantech.
- **Pre-labeled buttons** do not require any tedious insertion of small icon key "caps".
- **Up to 8 memory banks** can be selected by source buttons **with LED indicators**.
- **Two tiers of memory per button**. 2nd tier is accessed by "**Push and Hold**". Applies to both source select and control function keys.
- **Sequence commands, including 1 to 30 second delays**, can be programmed into any button (including the 2nd tier) without using up button spaces anywhere else on the keypad.
- **Status Input** permits source buttons to light up with +5 to +30V representing a system power ON condition as well as the selected source.
- **Intelligent Power Management**. Allows power commands to be sent only if the system or zone is Off, thus preventing unintended shutdown when switching sources.
- **IR Commands are "learned" directly** from hand held remotes **or by using Xantech's exclusive Dragon Drop-IR[™] software**.

- **Network Cloning** permits simultaneous transfer of programmed contents from one keypad to as many as 16 keypads wired on the same IR bus (single zone network).

Cloning can also be done from one keypad to another, or from a "virtual" keypad created with Dragon Drop-IR™, via the **COM Port**.

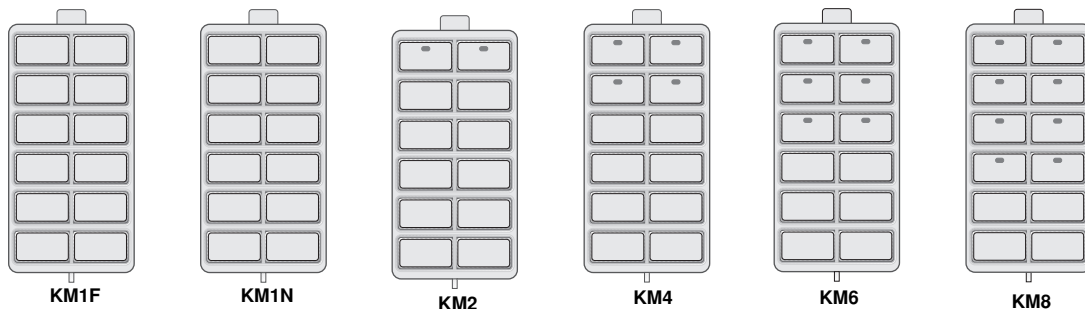
- **Dragon Drop-IR™** (optional), a Windows® based program, permits rapid configuring, learning, duplication and filing of SmartPad₃ programming.
- **Speaker Relay** permits local muting of speakers for single zone systems.
- **Code Group** and **Bank Tracking Programming** permit specialized configurations.
- **E² PROM** stores memorized contents. **No backup batteries needed!**
- **Write/Protect** switch safeguards memory contents.
- **Memory.** LM110; 8 kbytes. PM110; 32 kbytes.
- **Standard 4 terminal output** allows use on same IR bus as all Xantech IR Receivers and controllers.

MODULE DESCRIPTIONS

Perhaps the easiest way to become familiar with the **SmartPad₃** is to gain an understanding of the modules that make up the system. The modules are divided into two basic groups: the **Key** (or button) modules, and the docking **Base** modules. The Key modules plug into the Base modules.

The Key Modules

There are ten single-gang key module assemblies currently available. The first six shown have 12 buttons. The last four have 11 buttons and include a cursor key cluster. The module shells and buttons are available in white, ivory and black. An illustration and description of each follow:



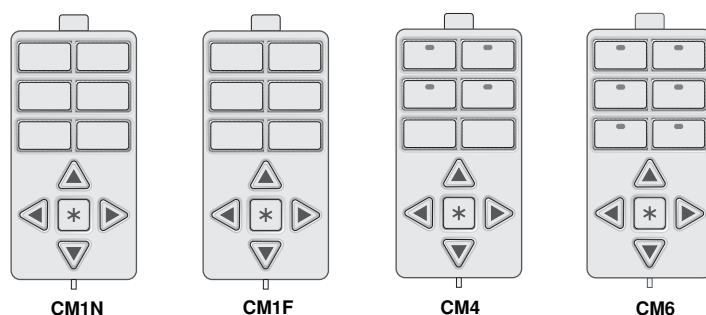
The **KM1F** module can be used as a single-gang single-bank keypad or, with other source selection or function modules, for 2 or 3-gang configurations. A selection of **function** buttons are included for function control commands.

The **KM1N** is similar to the KM1F except it is intended for direct numeric entry of channels on DSS receivers, disk/track selection on CD changers, etc. It can be used with other source or function modules for 2 or 3-gang configurations. **Numeric** and some **function** buttons are included.

The **KM2** includes 2 source (bank) keys and 10 function control keys. It can be used as a single-gang two-source (bank) keypad or, with other function modules, in 2 or 3-gang configurations. A selection of **source** and **function** buttons are included.

The **KM4** and **KM6** are similar to the KM2, except they have 4 source, 8 function and 6 source, 6 function keys respectively. Again, they can be used in 2 or 3-gang configurations. A selection of **source** and **function** buttons are included.

The **KM8** includes 8 source and 4 function keys. Again, it can be used as a single-gang 8-source (bank) keypad, or, with other function modules, for 2 or 3-gang configurations. A selection of **source** and **function** buttons are included.



The **CM1N** is similar to the CM1F except that it is set up for use with 6 numeric control buttons as well as the 5 cursor keys. **Numeric** and **cursor** buttons are included.

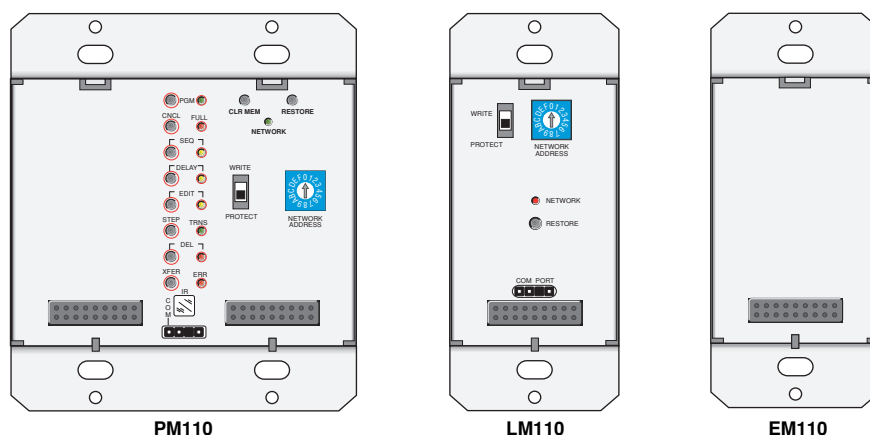
The **CM1F** module includes 6 function control keys plus a cursor button cluster with Up, Down, Left, Right, and Enter keys. The cursor keys can be used with sources that have menu driven on-screen displays. **Cursor** keys and a selection of **function** buttons are included.

The **CM4** is similar to the CM1F except that it is set up for use with 4 source (bank) and 2 function keys as well as the 5 cursor keys. **Cursor** keys and a selection of **source** and **function** buttons are included.

The **CM6** is similar to the CM1F except that it is set up for use with 6 source (bank) keys as well as the 5 cursor keys. **Cursor** keys and a selection of **source** buttons are included.

The Base Modules

There are three base modules in the **SmartPad₃** system into which the Key Modules are docked. They contain the electronics for programming & memory (except the EM110) and include flanges for J-box mounting. An illustration and description of each follow:



The PM110 dual gang **Programmable Module** is the base module for programming all of the commands and functions required for each installation. All programming, including sequences (macros), is done with the PM110 (unless done with Dragon Drop-IR™).

The LM110 **Learning Module** is intended for single gang applications and must receive its programming from a PM110 or Dragon Drop IR™ system. Programs are transferred from the PM110 or Dragon Drop IR to the LM110 with a 2-step transfer command.

The EM110 is a single gang **Expansion Module**. It has no memory and serves only to expand the number of key functions for the PM110 in 3-gang configurations.

BASIC CONFIGURATIONS & PROGRAMMING

Now that we have a conceptual understanding of the basic **SmartPad₃** system, let's dive right in and create three basic module and button configurations and apply the applicable programming.

A Two Gang Configuration

Suppose a client wants to control an AM/FM stereo system from a remote room with one 2-gang keypad and that he has the following equipment and system requirements:

1. An AM/FM receiver and 4 sources: **TUNER** (AM/FM), two **CD** changers and a cassette **TAPE** deck.
2. When a source button is pressed, the Smart Pad must turn on the AM/FM receiver and the associated source.
3. The keypad must have the following control function commands for each source:
TUNER: Tuner Up/Down (scroll of preset stations), AM/FM (select).
CD 1 and CD 2: Play, Scan Forward/Reverse, Track Forward/Reverse, Disk+, Disk– (select), Pause, Stop.
TAPE: Play Forward, Play Reverse, Fast Forward, Rewind, Pause, Stop.
4. Speakers in the remote room must be mutable by using the **relay** in the **SmartPad₃**.

This is the basic client specification for this application of the **SmartPad₃**.

The next step is to determine what **SmartPad₃ modules** and keypad **buttons** are required to perform this job, as follows:

1. Since there are 4 **sources**, 4 banks will be required. We will need the **KM4** for the first Key Module.
2. Since there are a good number of control **functions** to perform, we will need the **KM1F** for the second Key Module.
3. Now, since this is a 2-gang configuration, we need a **PM110** Base Module into which we plug the **KM1F** and the **KM4**. **Fig. 1** shows the basic configuration.
4. The next step is to determine exactly what **buttons** are required to carry out the control functions needed.
5. We begin this process by assigning the **Source** buttons first; **CD1**, **TUNER**, **CD2** and **TAPE**. See **Fig. 2**.
6. Next, we assign the **function** control buttons based on the list of functions given on page 7.

NOTE: Most of the buttons for steps 5 and 6 are available in the **SOURCE** bag of buttons supplied with the **KM4** and in the **FUNCTION** bag of buttons supplied with the **KM1F**. Buttons **CD1**, **OFF**, **RANDOM**, **A/B**, ***** and **◀** (reverse play) are not supplied but are available separately from Xantech. They are listed in the dealer price list (along with all buttons currently available for the **SmartPad₃** system). They should be ordered at the same time as the other keypad parts.

7. Now that all the buttons have been assigned (as shown in **Fig. 2**), it is necessary to insert them into the **KM1F** and the **KM4** module shells. Then insert the completed key modules into the **PM110**. See page 18 for Button and Module Assembly instructions.

NOTE: In this example, the button and module positions are placed in what is considered an ergonomically pleasing arrangement. You may, however, place the buttons in any arrangement you wish, to best fit taste and application.

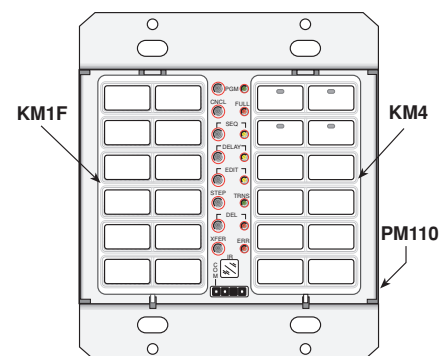


Fig. 1 Two Gang Configuration

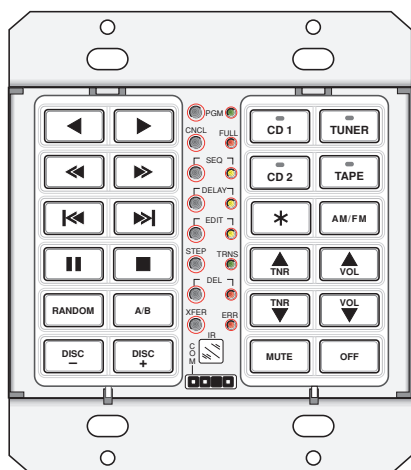


Fig. 2 Two Gang Button Assignments

The only exception to this is the 4 source buttons. They need to be kept in the 4 upper locations of the **KM4** in order for the source indicators and bank selections to operate.

You may also reverse the position of the **KM1F** and the **KM4** modules; the basic operation of the keypad will be identical.

8. The keypad is now ready to be wired into the total system. See **Fig. 3**. Power may then be applied and we can proceed with the Programming of each key.

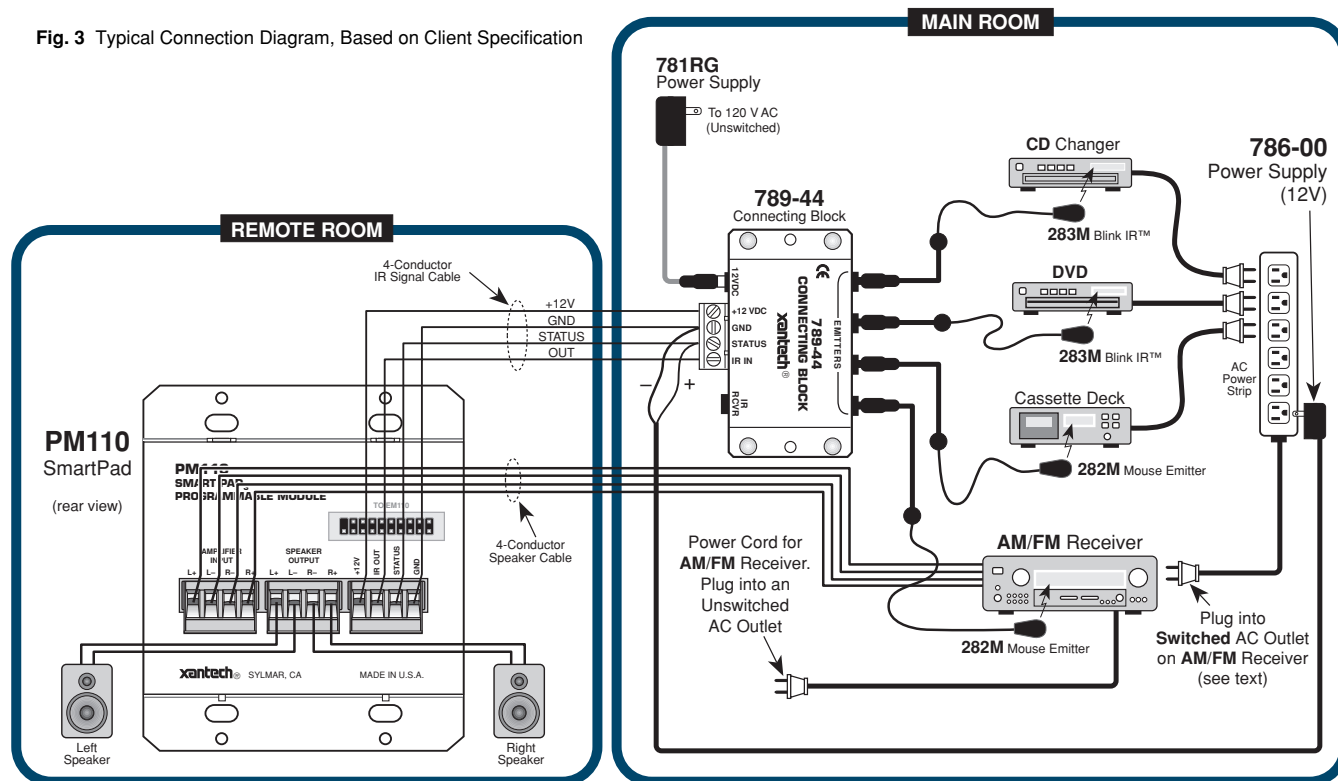
Programming a Two Gang Configuration

Before proceeding with this section, it is recommended that you read "PROGRAMMING THE SMARTPAD₃", page 20, where full programming details are given. The following is a brief procedure, specific to this installation example. It assumes you already have some familiarity with the programming procedures. **NOTE:** STATUS

and AC power management are accomplished using sequenced commands and the Switched AC Outlet on the AM/FM receiver. Refer to **Fig. 3**.

We'll begin by "teaching" commands to the 4 source (bank) buttons:

Fig. 3 Typical Connection Diagram, Based on Client Specification



1. Press **SEQ**. The SEQ LED will flash.
2. Press **CD1**. CD1 LED will come on and the SEQ LED will come on steady.
NOTE: Turn the AM/FM receiver ON so that +12V is applied to the STATUS line. This ensures that the source button LED's will light.
3. Point the AM/FM receiver remote at the IR window and press it's POWER key.
4. When the code is learned, the SEQ LED will flash and then go steady when you release the POWER key on the remote.

5. Press **DELAY**. DELAY LED will flash. Press **DELAY once again** to enter a 1 second delay. (The 1 second delay allows some time for the AM/FM receiver to power up to be sure it will execute the CD source command).
6. Press **CNCL** to return to SEQ mode.
7. Point the AM/FM receiver remote at IR window and press it's CD1 (source) button.
8. When the CD1 code is learned, the SEQ LED will flash then go steady when you release the CD1 key on the remote.
9. Press **CNCL twice** to leave the sequence mode.

You can now test the learned commands. But first, be sure the AM/FM receiver's Power is turned OFF and the emitters are placed on each of the components as shown in **Fig. 3**. Now press the **CD1** button. The AM/FM receiver should turn ON and it's source selector should switch to the CD1 position.

Using the same procedure, program the remaining source buttons. Just be sure to press the correct source button in steps 2 & 7 above. As you complete each source (bank) button, test it before going on. Repeat the procedure, as necessary, until correct operation is obtained.

When the **source** buttons are complete, proceed to program each of the 20 **function** buttons as follows:

1. First, press **CD1** to select the CD1 bank. The functions that apply to this source (bank) will now be "taught" (programmed) into the applicable function buttons.
2. Press **PGM**. The PGM LED will flash.
3. Press ► (play) button. The PGM LED will come on steady.
4. Point the CD1 (CD player) handheld remote at the IR window and press it's ► (play) button.
5. When the code is learned, the PGM LED will flash again, indicating it is ready to learn a command at another button.
6. Press ◀◀ (reverse scan) button. The PGM LED will come on steady.
7. Point the CD1 remote at the IR window and press it's ◀◀ (reverse scan) button.
8. When the code is learned, the PGM LED will flash again, indicating it is ready to learn a command at another button.
9. Using this same procedure, program all the remaining commands that are applicable to the CD1 as follows: ►► (forward scan), ◀◀ (reverse skip), ►► (forward skip), || (pause), ■ (stop), **RANDOM**, **DISC** ₊, and **DISC** ₋).
10. When finished, press **CNCL** to leave the PGM mode.

At this point, check all commands to see that they operate correctly. Reprogram as necessary.

11. Next, press **CD2** to select the CD2 bank. Program the 2nd CD player's commands into the **function** buttons, using the same procedure as above.

NOTE: In this example, it is assumed that the 2nd CD player is a different brand so that the IR commands of the 2 players do not interact with each other.

12. Next, press **TUNER** to select the tuner bank. In this case, there are only 3 functions that relate directly to tuner operation; ▲ _{TNR}, ▼ _{TNR} (up and down tuning - usually the selection of preset stations) and **AM/FM** (selection of the AM or FM band). Program these **function** buttons from the AM/FM receiver's remote, using the same procedures as above.

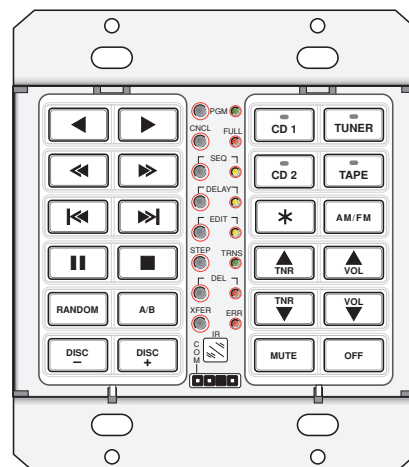


Fig. 4 Programming Source & Function Buttons

13. When the TUNER functions are complete, press **TAPE** to select the tape bank. Using the Tape deck's remote, program the seven **function** buttons that relate to this source as follows; ◀ (reverse play), ▶ (forward play), ◀◀ (fast rewind), ▶▶ (fast forward), || (pause), ■ (stop), and **A/B** (selects A or B decks of a dual cassette deck).

Common Commands. The last group to be programmed are those that are **common** to each source or bank. In this case, they will be ▲VOL, ▼VOL (volume up/down), **MUTE** and **OFF**.

14. Select each bank (source button), one at a time, and program these **function** buttons from the AM/FM receiver's remote. Program the MUTE button with the speaker relay MUTE TOGGLE command. See "**Speaker Relay**" section).
15. When you have completed all programming, you can **transfer** this whole command set to any number of additional keypads (identically configured) that you may need in multiroom installations. Refer to the "**Command Transfers** (Cloning)" section.

NOTE: The * (asterisk) key is not used in this particular application.

A Single Gang Configuration

Many times a client wants a very simple keypad system with only a few basic functions or wishes to have minimum intrusion into the room decor. In this case, a single gang application of the SmartPad₃ would be appropriate. We will assume that the client has the following equipment and system requirements:

1. An AM/FM receiver and 4 sources: **TUNER** (AM/FM), two **CD** changers and a cassette **TAPE** deck.
2. When a source button is pressed, it must turn the AM/FM receiver ON along with the associated source.
3. The keypad will have the following control function commands for each source:
TUNER: Tuner Up/Down (scroll of preset stations).
CD 1 and CD 2: Play, Track Forward/Reverse, Pause, Stop, Disc +.
TAPE: Play Forward, Fast Forward/Rewind, Pause, Stop.
4. Speakers in the remote room must be mutable by using the **relay** in the **SmartPad₃**.

This is the basic client specification for this application of the **SmartPad₃**.

The next step is to determine what **SmartPad₃ modules** and keypad **buttons** are required to perform this job, as follows:

1. Since there are 4 **sources**, we can use the **KM4** Key Module, which provides 4 sources with status indicators and 8 function keys.
2. Now, since this is a 1-gang configuration, we need an **LM110** Base Module into which we plug the **KM4**, as shown in **Fig. 5**.
3. The next step is to determine exactly what **buttons** are needed to carry out the control functions needed.
4. Again, we begin this process by assigning the **Source** buttons first; **CD1, TUNER, CD2** and **TAPE**. See **Fig. 5**.
5. Next, we assign the **function** control buttons based on the list of functions given on page 12.

NOTE: Most of the buttons for steps 4 and 5 are provided in the **SOURCE** and **FUNCTION** bags of buttons supplied with the **KM4**.

Buttons **CD 1** and **OFF** are not supplied but are available separately from Xantech. They are listed in the dealer price list (along with all buttons currently available for the **SmartPad₃** system). They should be ordered at the same time as the other keypad parts.

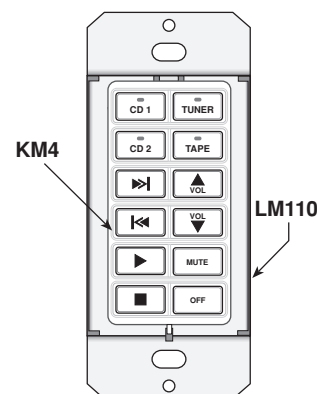


Fig. 5 Single Gang Button Assignments

- Now that all the buttons have been assigned (as shown in **Fig. 5**), it is necessary to assemble them into the **KM4** key module. Then insert the completed key module into the **LM110**.

See "Button and Module Assembly", page 18, for instructions.

NOTE: In this example the buttons are placed in what is considered an ergonomically pleasing arrangement. Again, you may place the buttons in any arrangement you wish, to best fit taste and application.

The only exception to this is the 4 source buttons. They need to be kept in the 4 upper locations in order for the source indicators and bank selections to operate.

- The keypad is now ready to be wired into the total system. See **Fig. 6**. Power may then be applied and we can proceed with the Programming of each button.

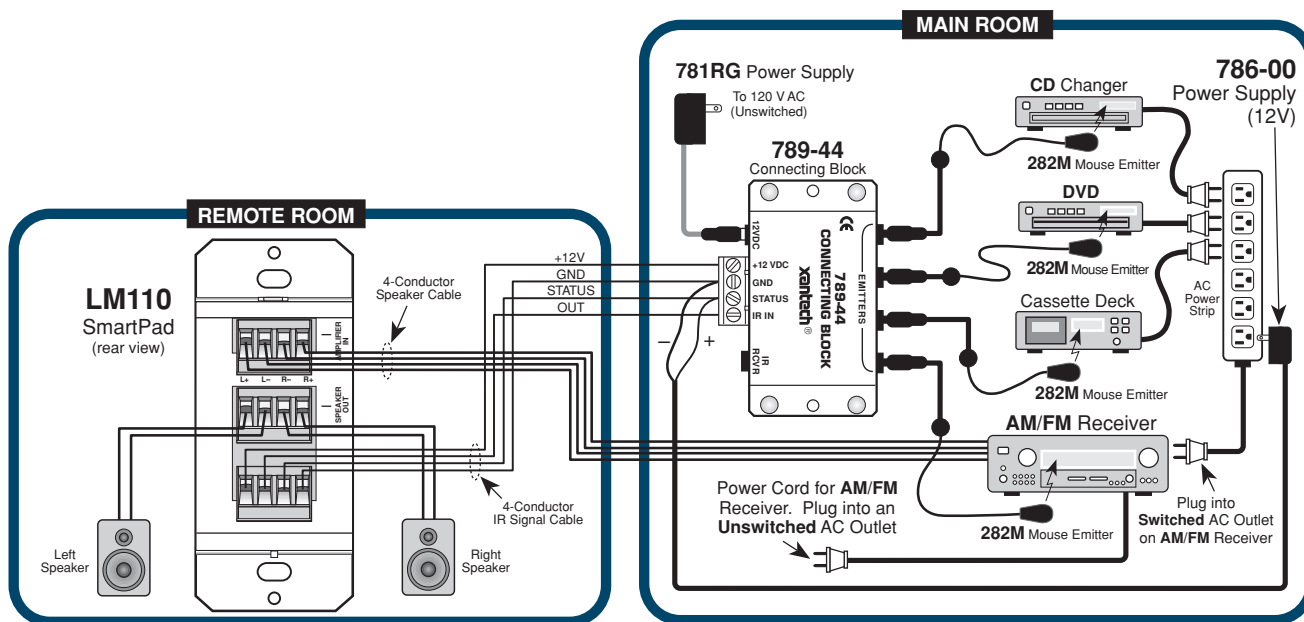


Fig. 6 Typical Connection Diagram, Based on Client Specification, page 12.

Programming a Single Gang Configuration

As mentioned on page 6, the LM110 must receive its programming from a PM110 or Dragon Drop IR™. (This means that you, the installer, must have a PM110 or Dragon Drop IR on hand, to program LM110's for single gang applications). Before proceeding with this section, it is recommended that you read "PROGRAMMING THE SMARTPAD₃™" section, where full programming details are given. The following is a brief procedure, specific to this installation example.

NOTE: STATUS and AC power management are accomplished using sequenced commands and the Switched AC Outlet on the AM/FM receiver. Refer to **Fig. 6**.

We'll begin by "teaching" commands to the 4 source (bank) buttons:

- Insert the KM4, with selected buttons installed, **into the left bank** of a PM110. See **Fig. 7**.
- Be sure the PM110 is powered, by wiring it to a connecting block same as shown in **Fig. 3**.
- Press **SEQ**. The SEQ LED will flash.
- Press **CD1**. CD1 LED will come on and the SEQ LED will come on steady.

NOTE: Turn the AM/FM receiver ON so that +12V is applied to the STATUS line. This ensures that the source button LED's will light.

- Point the AM/FM receiver remote at the IR window and press its POWER key.

6. When the code is learned, the SEQ LED will flash then go steady when you release the POWER key on the remote.
7. Press **DELAY**. DELAY LED will flash. Press **DELAY once again** to enter a 1 second delay. (The 1 second delay allows some time for the AM/FM receiver to power up to be sure it will execute the CD source command).
8. Point the AM/FM receiver remote at **IR** window and press it's CD1 (source) button.
9. When the CD1 code is learned, the SEQ LED will flash then go steady when you release the CD1 key on the remote.
10. Press **CNCL twice** to leave sequence mode.

NOTE: Because we have fewer keys to work with in a single gang configuration, we will use the CD1 button, on the 2nd tier, to provide the Disc+ function.

This means the user would 1st press CD1 button for less that 1 sec. to select the source. He could then press the CD1 button for more than 1 sec. to cause the CD changer to step (or skip) forward one disc at a time, as desired.

11. Press **SEQ**, then **CD1**, then **CNCL**, then **CD1** again. This places you in the 2nd tier of CD1. (See also **Tiering**, page 25).
12. Point the CD1 remote at **IR** window and press it's DISC+ or DISC SKIP button.
13. When the code is learned, the SEQ LED will flash then go steady when you release the key on the remote.
14. Press **CNCL two times** to exit the programming tier mode.

You can now test these learned commands. But first, be sure the AM/FM receiver's Power is turned OFF and the emitters are placed on each of the components as shown in **Fig. 6**.

Using the same procedure, program the remaining source buttons. Just be sure to press the correct source button in steps 4 & 11 above as you go from source to source. Remember that you do not need the tier command except for sources CD1 and CD2 (for DISC+).

As you complete each button, test it before going on. Repeat the procedure, as necessary, until correct operation is obtained.

When the **source** buttons are complete, proceed to program each of the 8 **function** buttons, using essentially the same steps as outlined for the 2-gang configuration, previous. The only difference is there are fewer buttons involved. Also, the TUNER up/down tuning commands need to be stored under the **▶▶** and **◀◀** buttons on the **TUNER** bank.

NOTE: A 2nd tier could be added to the TUNER button for AM/FM selection, if desired.

Program Transfer

Now that programming is complete, we need to transfer the learned commands from the PM110 to the LM110. Proceed as follows:

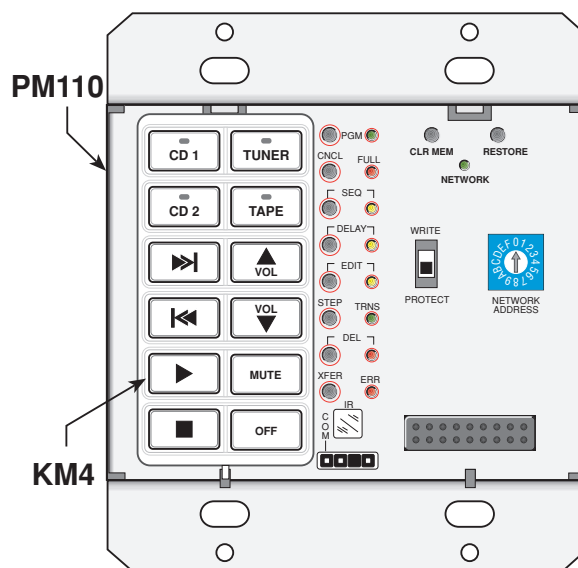


Fig. 7 Programming a Single Gang using a PM110

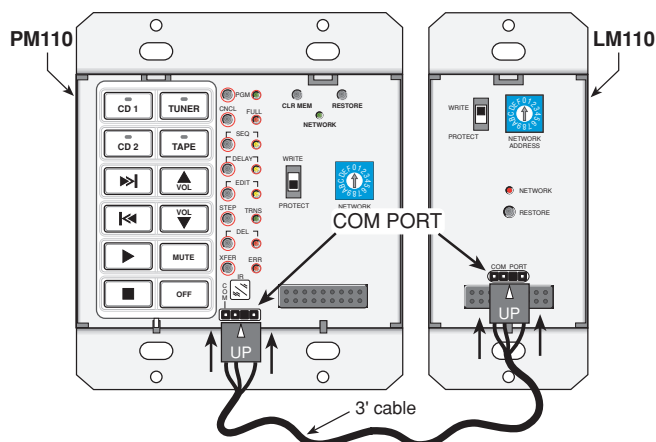


Fig. 8 PM110 to LM110 Program Transfer

1. Using the 3' cable supplied with the PM110, simply plug it into the **COM** Port of each unit as shown in **Fig. 8**.
2. Be sure both the PM110 and the LM110 are powered and that the LM110's WRITE PROTECT switch is set to **WRITE** before proceeding.
3. Press **XFER** key on the PM110. The PGM and SEQ LEDs will flash.
4. Press **PGM**. The PGM and SEQ LEDs will continue to flash until the entire memory contents are downloaded to the LM110.
5. Disconnect the 3' cable.
6. Remove the KM4 from the PM110 and insert it into the LM110.

The LM110 is now ready for final operation.

Note: If transfer does not complete or the ERR LED shows, remove power from both units, reapply power and try again.

A Three Gang Configuration

For the client who wants to control a larger group of sources and functions than that permitted by two gangs, it is necessary to move up to a three gang configuration of the SmartPad₃. Again, let's assume the client has the following equipment and system requirements:

1. An AM/FM receiver and 6 sources: **TUNER** (AM/FM), a **CD** changer, an **LD** (Laser Disc player), a cassette **TAPE** deck, a **SAT** (Satellite receiver) and a **VCR**.
2. When a source button is pressed, it must turn on the AM/FM receiver and the associated source.
3. The keypad must have the following control function commands for each source:

TUNER: Tuner Up/Down (scroll of preset stations), AM/FM (select).

CD: Play, Scan Forward/Reverse, Track Forward/Reverse, Track select (using numeric entry), Disk select (using numeric entry), Pause, Stop.

LD: Play, Scan Forward/Reverse, Chapter Forward/Reverse, Pause, Stop.

TAPE: Play Forward, Fast Forward/Rewind, Pause, Stop.

SAT: Menu, Guide, Cursor (Arrow) Keys, Channel Up/Down, Channel Select (using numeric entry) and Recall (previous channel).

VCR: Play, Scan/Fast Forward/Rewind, Pause, Stop.

This is the basic client specification for this application of the SmartPad₃.

As with the previous configurations, the next step is to determine the **SmartPad₃ modules** and keypad **buttons** needed to perform this job. Using the client specification and similar procedures to those on pages 7 and 8, we have come up with the module and button assignments as shown in **Fig. 9**.

When making these choices, keep the following in mind:

1. Since both a numeric and a cursor module are used, special consideration is needed to best utilize the available function keys. For instance, the CM1F cursor module was chosen for ease of use with the SAT receiver. You will need, however, to use these keys on the CD, LD, TAPE and VCR banks to perform such functions as Track Forward/Reverse, Chapter Forward/Reverse, Scan/Fast Forward/Rewind, etc.
2. The numeric buttons can be used for direct entry of AM/FM stations, disc and/or track

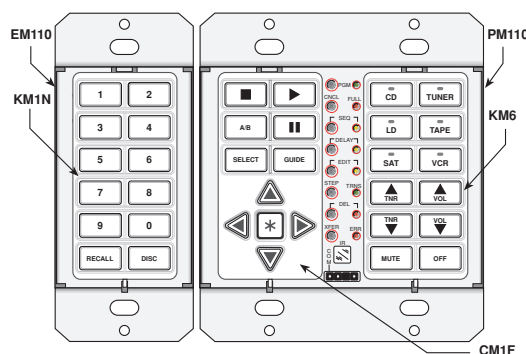


Fig. 9 3-Gang Module & Button Assignments

selections on CD, Channel selection on SAT & VCR, etc., on their respective banks.

3. The ▲, ▼ buttons for the AM/FM Tuner can also serve as Channel Up/Down for SAT & the VCR TV tuner.
4. Use the 2nd tier on the TUNER button for AM/FM selection, if desired.

Programming a Three Gang Configuration

1. When you have completed the assembly of the buttons and the modules and have installed them into the PM110 & EM110 as shown in **Fig. 9**, connect them together with the ribbon cable as shown in **Fig. 10**. Locate **red stripe** side of cable as shown.
2. You can now program this configuration in the same manner as described in the procedures on pages 9 through 11.
3. When you have completed all programming, you can **transfer** this whole command set to any number of additional keypads (identically configured), as needed, in multi-room installations. Refer to the "**Command Transfers (Cloning)**" section.

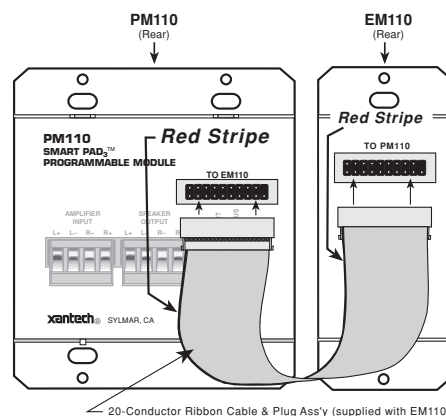


Fig. 10 3-Gang EM110 to PM110 Connections

BUTTON AND MODULE ASSEMBLY

The key module assemblies have been designed specifically so that they can be custom configured with the desired button arrangements. To assemble, disassemble, change and reassemble, as desired, proceed as follows:

Assembly

1. First, decide on the buttons you need and their locations (see examples on pages 8, 12 & 17).
2. Pick up the **Key Module PCB & Base** assembly and carefully push each **button** onto the **Rubber Actuators** in the locations you desire. Refer to **Fig. 11**.
(As received from the factory, the key module shell is separate from the key module PCB & base assembly).
3. When the buttons are completely in place, pick up the **Key Module Shell** and lower it over the **Key Module PCB & Base** assembly. (**Figs. 11 & 12**).
4. Move the buttons slightly, as necessary, to align them so that they pass through the button openings in the **Key Module Shell**.
5. Carefully press the **Key Module Shell** down until the 4 small **Retainer Tabs** (**Fig. 11**) on the **Key Module PCB & Base** assembly snap into the corresponding **Retainer Slots** on the **Key Module Shell**.
6. Mount the completed key module into the PM110 (or LM110 or EM110). Place the **Front Tab** on the module under the **Small Lip** of the PM110. Align the **18-pin plug** with the **18-pin socket** and carefully push into place. See **Fig. 13**.

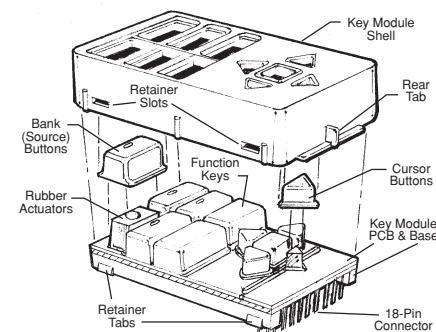


Fig. 11 Typical Key Module Assembly

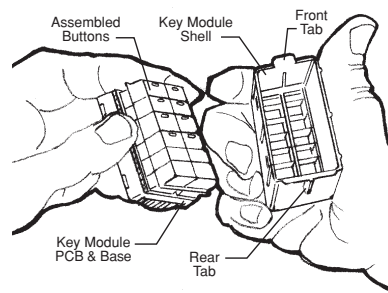


Fig. 12 Assembly of Key Module Shell

Disassembly

You may find it necessary, from time to time, to disassemble the key module to change buttons for system updates, etc. Proceed as follows:

1. Remove the key module from the PM110 (or LM110 or EM110) by pulling upward at the 18-pin connector end of the module.
2. Grasp the key module with both hands, with the buttons facing you. See **Fig. 14**.
3. With the fingers of each hand pull **outward** on the lower edges of the key module shell.
4. As the 4 small retainer tabs recede from the slots on the sides of the key module shell, **press down** on the buttons with your thumbs.
5. The key module shell should now move away from the key module PCB and base assembly.

CAUTION: To avoid damage, be sure not to use excessive force when executing this disassembly procedure.

6. When you have made the desired button changes, reassemble the unit using the steps given under "**Assembly**".

PROGRAMMING THE SMARTPAD₃[™]

The following procedures detail the overall programming capabilities of the SmartPad₃. In general, the unit is capable of learning single, sequenced (macros) and tiered commands under each button for any of the keypad configurations. The system supports up to a maximum of 8 banks (sources) whether one uses the single, dual, or 3-gang configurations. The actual number of banks depends on the key modules you select for the job. Allowable choices are 1, 2, 4, 6, or 8 banks.

A summary of the **SmartPad₃** programming features are:

- Learns pulse or carrier IR type commands.
- Supports IR commands, "push & hold" tiering and sequence commands on any key.
- Commands storable into 1 to 8 banks, selectable by bank keys.
- Editing of command sequences.
- Intelligent Power Management [inhibits first command in a sequence (power On/Off) if STATUS terminal sees +5 to +30V DC].
- Bank tracking signal switches all keypads to the same bank, irrespective of which keypad's source button is pressed (provided the keypads are on the same IR bus network).
- Network Addressing allows code transfer over the IR bus (network) from a programmed keypad to as many as 16 keypads simultaneously.
- RS232 data compatible COM port permits cloning between keypads and from Dragon Drop IR[™] software.
- Optional Windows based Dragon Drop IR[™] software permits complete virtual keypad programming on a PC with code transfer to individual keypads via the COM port.
- Speaker Relay programming.
- Code Group Programming.
- Bank Tracking Programming.
- User configurability of buttons into key modules and key modules into base units.

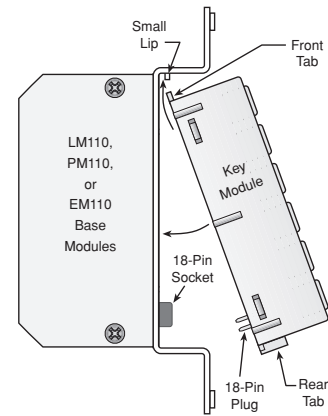


Fig. 13 Key Module Assembly to Base Module

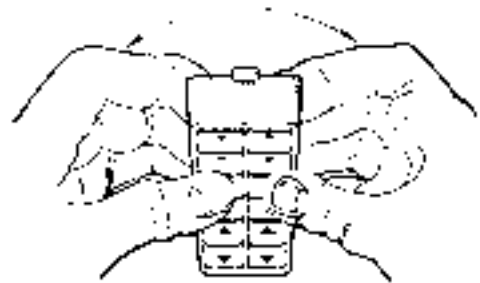


Fig. 14 Key Module Disassembly

Button & LED Indicator Descriptions

The following small buttons and indicators are located on the PM110 in the space between the two gangs and under the right key module as shown on page 6 and **Fig 15**. **NOTE:** Use a blunt tool to press programming buttons, such as the tip of a 3.5mm mini plug. **Do not use sharp objects!**

1. **PGM** - Places the keypad in Program Mode.
PGM LED flashes when in Program Mode.
2. **CNCL** - Cancels (exits) the various programming modes. LED's will stop flashing.
3. **FULL LED** - Flashes when the user program memory is full.
4. **SEQ** - Places keypad in Sequence mode for programming of command sequences (or macros).
SEQ LED flashes when in Sequence Programming mode.
5. **DELAY** - Adds timed delays (1 to 30 seconds) between commands in a Sequence, either during first programming of a Sequence or subsequent Editing of a Sequence.
DELAY LED flashes when in Delay Mode.
6. **EDIT** - Allows editing of existing sequences.
EDIT LED flashes when EDIT is first pressed.
7. **STEP** - Steps through each command when editing a Sequence (in EDIT mode).
8. **TRNS LED** - Lights steady during the interval when IR commands are sent to the IR output line for the controlled equipment. The TRNS (transmit) LED will light whether or not there is continuity in the output circuit. It will not light with bank tracking codes coming from other keypads.
9. **DEL** - Deletes single, sequenced & tiered IR commands from any individual key.
DEL LED flashes when in Delete Mode.
10. **XFER** - This key, with a subsequent press of the PGM key, initiates the transfer (cloning) of programmed contents from one keypad to another via the **COM** Port connector. Also, pressing XFER then SEQ, will initiate cloning to multiple keypads via the **IR OUT** (Network) line.
11. **ERRor LED** - Lights when an IR command cannot be learned correctly during the learning process.
12. **IR** - This Infrared sensor window receives IR commands from remote controls for programming only. It **will not** repeat commands through the network system.
13. **COM Port** - RS232 signal compatible port for uploading or downloading to/from a computer or transferring programmed contents from one keypad to another.
14. **CLR MEM** - Clear Memory. Erases all user programmed commands when pressed twice within 1 second. Bank key flashes momentarily. Also **restores all factory defaults** for Speaker Relay, Code Group and Bank Tracking Programming.
15. **RESTORE** - Resets unit to restart operation after errors, lockups, etc. Program key flashes momentarily. Does not erase user programmed commands.
16. **NETWORK LED** - Flashes with any activity on the IR output line (IR commands being transmitted, bank tracking codes, etc.).

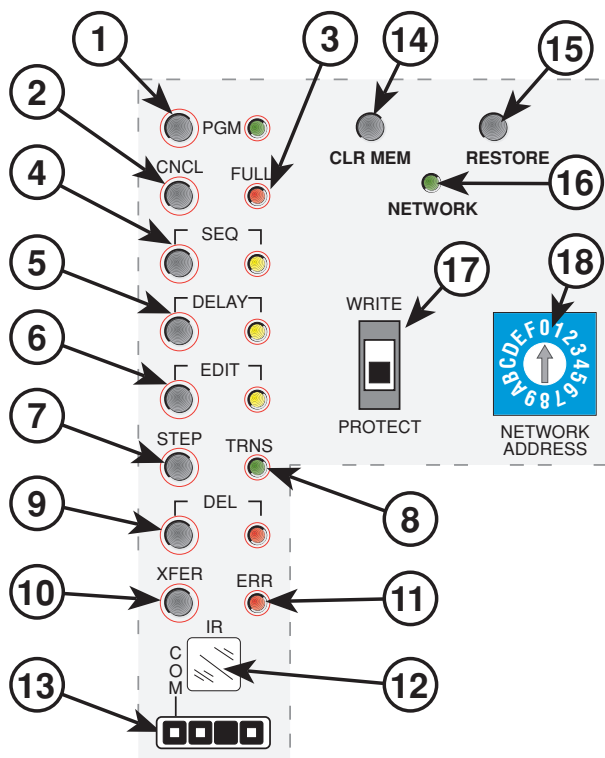


Fig. 15 Programming Buttons & Indicators

NOTE: The LM110 includes only a **NETWORK** LED and a **RESTORE** button. Refer to illustration on page 6.

17. **WRITE PROTECT** Switch. Must be in **WRITE** position for all programming. **PROTECT** position prohibits programming and protects all stored data from unintended erasure.
18. **NETWORK ADDRESS** - 16 position (0~F) switch allows up to 16 PM110/LM110 modules to have a unique network address. Each module on a common IR bus (network) must be set to a unique network address, prior to programming, to allow network cloning.

PROGRAMMING

Power Up: Begin by connecting the keypad to a typical system such as that shown in **Fig 3**. Be sure the STATUS terminal is connected to +12V so that the source (bank) LEDs will light. Also, set the **WRITE/PROTECT** switch to **WRITE** and the **NETWORK ADDRESS** to a **unique position** for each keypad used in the system.

The following conditions are established when power is applied:

- The unit resets and operation begins.
- The keypad defaults to bank #1 (top left source button) after each power up.
- The unit is now ready for programming, communications with a PC or cloning of programmed contents from one keypad to another.

Learning IR Command Codes

To teach IR commands to the unit, refer to **Figs. 15 & 16** and proceed as follows:

1. Press the desired **Source** (bank) button. The Source button LED will light.
2. Press the **PGM** (program) button. The PGM LED will flash.

CAUTION: Use a blunt tool when pressing the programming buttons, such as the tip of a 3.5mm mini plug. Do not use pens, pencils, etc., as they may damage or contaminate the switch material.

3. Now press the desired target key (one of the **Function** or **Source** buttons).

With the target button selected and the PGM LED has stopped flashing, you are ready to input the IR command from the handheld remote control.

NOTE: If you change your mind and wish to teach a different button than the one you just selected, simply press CNCL once, and press the other button.

4. With the remote pointed at the IR window (1 to 2 inches away), **press the key on the remote** that has the command you want to save.

The PGM & SEQ LED's will flash while storing. When storing is complete, the PGM LED will flash again by itself.

NOTE: If the ERR (error) LED flashes, an error has occurred during programming (such as holding the handheld remote too far away from the keypad, for example), indicating the unit has not learned

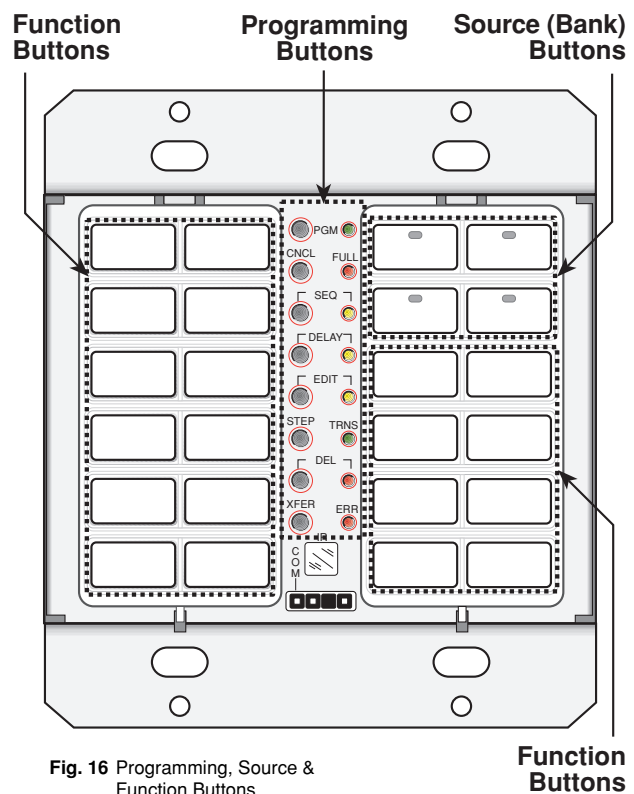


Fig. 16 Programming, Source & Function Buttons

the command successfully. If this happens, wait for the PGM LED to come back on steady and repeat step 4.

- Now that the PGM LED is flashing again, **press another target** button and input another IR command. When you are done learning commands, press **CNCL** (cancel) **to exit** the PGM mode. The PGM LED will go off.

CAUTION: You must **leave** the **PGM** mode by pressing **CNCL** (press **twice** if in **SEQ** mode) before programming a different source (bank).

NOTE: If you are using a **STATUS Jumper** (Fig. 17) or programming for a ZPR68, **it will be necessary for you to program Source commands twice into each bank**, using the **SEQ** (sequence) button, in order for the Source commands to operate.

Sequence Programming (Macros)

You can teach more than one IR command per button by using the Sequence Programming feature. This permits several commands to be executed by one key press to carry out a macro of several system functions. To teach a sequence of commands to a single button, do the following:

- Press the **SEQ** (sequence) button. The SEQ LED will flash.
- Now press the desired target button just as when doing regular IR programming. (This can be a Source or a Function button). The SEQ LED will come on steady to indicate that it is ready for IR input.
- Point the remote at the IR window (1 to 2 inches away) and **press the key on the remote** that has the command you want in the sequence.
- When the command has been learned, the SEQ and PGM LEDs begin flashing and continue to flash until you release the key on the remote.
- The SEQ LED will then turn on steady again to show that it is ready for another command.
- Repeat these steps for as many IR commands as you want in the sequence.
- When finished, press the **CNCL** key. The SEQ LED will flash, indicating that a different Source or Function button may be selected to enter another sequence (repeating the steps above).
- To **exit** the sequence mode completely, **press CNCL two times**. The SEQ LED will go out.

Power Management

Normally you want a power command under each Source (bank) button so that the system is turned ON no matter which Source button is pressed. However, without Power Management, pressing a 2nd Source button would send out a 2nd power command, turning the system OFF.

- The SmartPad₃ power management system prevents this by stopping the first command in the sequence (the power command) when the STATUS terminal is **High** (+5 to +30V DC).
- Similarly, when the system is OFF, the first command (power) will be sent since the STATUS terminal is **Low** (0V).
- This assumes that a **High** and a **Low** voltage, representing the ON and OFF condition of the

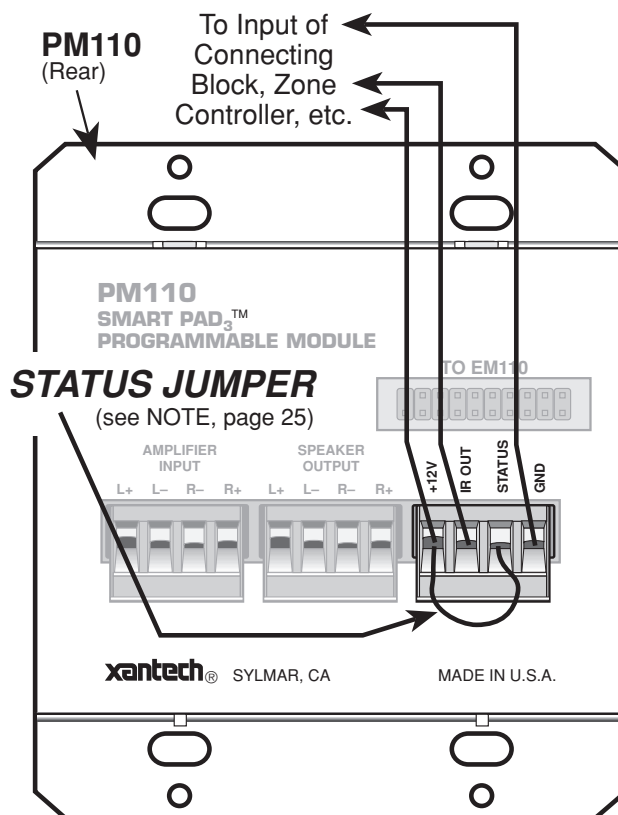


Fig. 17 Status Jumper Required When Power Management is **Not** Used

system or zone, is applied to the STATUS terminal on the rear of the keypad.

- See **Figs. 3** and **6** for typical connections for STATUS operation.

To take advantage of power management, program two or more sequence steps **on each Source button**. Typical command sequences, with **Power first**, might be as follows:

a) **TUNER Source Sequence (3 steps):**

Power, Delay, Tuner (source)

b) **CD Source Sequence (4 steps):**

Power, Delay, CD (source), Play (CD play)

NOTE: If power management is **not** used (i.e. 3-wire hookups), a short jumper **must** be connected between the **STATUS** and **+12V** terminals (see **Fig. 17**).

This powers the source button LEDs so they will come on with the selected bank. In this case, you **must** put the system power command under an ON/OFF button (**not** under the source buttons). **The user will then need to make two initial button presses, one for ON and one to select the Source.** (See also **NOTE** top of page 24).

CAUTION: ZPR68 Installers. When programming the SmartPad₃ for control of a ZPR68, you will need to place the source select commands twice under each source button (in a 2-step sequence). This permits sources to be selected after zone turn-on. (They would otherwise be blocked when zone turn-on drives the **STATUS** line high).

Tiering

The SmartPad₃ has the ability to program sequences or single commands onto two tiers or levels on any Source or Function button. The 2nd tier is accessed by a "Push & Hold" of the tiered button. This is very useful when working with a limited number of buttons, such as single gang applications of the SmartPad₃.

- After tiering is programmed, the **1st tier** is activated when the button is pressed for **less than 1 second**.
- The **2nd tier** is accessed by a "Press & Hold" of the same button for **more than 1 second**.

- The **1st tier** would typically be used to perform an initial function, such as power on, source selection, track skip, etc.
- The **2nd tier** would typically be used for a secondary function that is related to the first tier, such as music scan tiered on a track skip button for CD.

1. To program the **1st tier** of a button, simply program a single command or a sequence following steps 1 to 6 under "Sequence Programming" (page 24).
2. Press **CNCL** **once** to end the sequence, then **press the designated target key again** in order to activate the **2nd tier**. (If a 2nd tier is not desired at this point, press CNCL a second time to exit the Sequence mode. The key will then default to single tier operation).
3. Once in the **2nd tier**, program the desired command or sequence (with delays if needed, following steps 2 to 6 below). When finished, hit **CNCL twice** to exit.

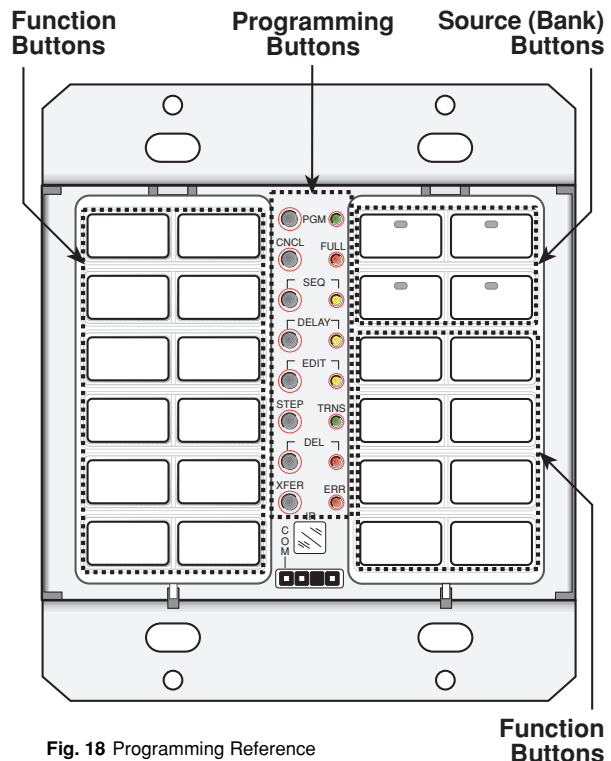


Fig. 18 Programming Reference

Programming Delays

Some IR controlled units may require an increased time interval between certain commands, particularly between a Power ON command and a Play command, for instance, to operate correctly.

- When programming sequences, you can place delays between such commands so that sufficient time is given for all functions to execute.
- The SmartPad₃ allows the insertion of timed delays at any point within a sequence. Proceed as follows:
 1. Press the **SEQ** button to enter commands as described under Sequence Programming .
 2. Just before you enter a command that requires a delay, press the **DELAY** button to enter the DELAY mode. The DELAY LED will flash.
 3. Now press the **DELAY** button, successively, to enter the number of seconds of delay you want. (Each press of the DELAY button, *after* the initial press, adds 1 second, up to a maximum of 30 seconds).
NOTE: The SmartPad₃ system already includes a 1/3 second interval between each command placed in a sequence. Each second you add will be in addition to the 1/3 second that already exists.
 4. Press **CNCL** *once* to exit from DELAY mode and return to Sequence mode.
 5. Next, enter the command that requires the delay. Continue programming the remaining commands you desire in the sequence. Just before entering another command requiring a delay, repeat steps 2, 3 and 4 above.
 6. When finished with the sequence, press **CNCL** *twice*. The delay times entered are now stored as part of the sequence.

Sending IR Commands

Once you have “taught” the desired IR commands and/or sequences to the keypad, and have pressed **CNCL** to leave the programming modes, you may send them to the controlled equipment simply by pressing the key that relates to them. It is recommended that you test each set of commands you have placed in a bank before proceeding to the next bank.

Deleting Commands

If you want to delete a command or sequence from any button, simply do the following:

1. Press the **DEL** (delete) button. The DEL LED will flash.
2. Press the target button that has the command(s) you wish to delete. The DEL LED will come on steady.
3. When erasure is complete, the DEL LED will resume flashing. If you wish to delete from other buttons, you can do so now by repeating the procedure from step 2.

NOTE: One press of the target key will delete all commands in a sequence *and* on the 2nd tier (if used). If you want to delete or change individual commands in a sequence, you must do so in the Sequence Editing mode.

4. When done, press **CNCL** to exit delete mode. The DEL LED will go out.

Sequence Editing

Long sequences (probably with some delays interspersed between commands) will likely have to be edited and experimented with to achieve correct timing control of the associated equipment.

- Editing is done in the **EDIT** mode using the **STEP**, **DELe**, **PGM** and **DELAY** buttons.
- It is best to think of the command sequence as a set of items laid end to end. When you activate the EDIT mode, it sets the edit pointer to the front of this string of items.
- You use the STEP key to individually transmit and step through each command in the sequence. This lets you see which commands are where, if all are working correctly, etc.
- If you activate a command that does not work or is incorrect, you can press the **DEL** key to remove it and then the **PGM** key to store a new command in its place.

- Additionally, you may insert delays into the sequence, as needed, for slow responding equipment.
- In this way you can work through the entire sequence, fixing problems as you go.

To edit a sequence, proceed as follows:

1. Press the **EDIT** key. The EDIT LED will flash.
NOTE: If you press the EDIT button and then change your mind or want to exit the operation at any time, press the **CNCL** button **twice**.
2. Press the button having the sequence you wish to edit. The EDIT LED will go on steady. This indicates that the sequence is open for editing. The edit pointer (insertion point) will be at the first item in the sequence.
3. Press the **STEP** key to preview the first command in the sequence.
4. The command transmits. Watch to see what happens with the controlled unit. (**Note:** The TRNS LED lights during transmit).
5. The edit insertion point will now be positioned in front of the next command in the sequence.

Deleting a Command Within a Sequence

6. If the command you just transmitted did not work and you wish to delete it, press the DEL button. The DEL LED lights, then goes out, indicating the command has been deleted.
You may now STEP to the next command.

The DEL button will always delete the command that was last transmitted.

Inserting a Command

7. To insert a new or replacement command, press the **PGM** button. The PGM LED will come on steady.
8. Input the **IR command** in the normal manner.
9. When stored, the PGM and SEQ LED will flash, then go out. You may now STEP to the next command.
NOTE: You do not have to delete anything to add a new command to the sequence.

Inserting a Delay

A delay may also be inserted in a similar manner.

10. Step through the sequence to a place just ahead of the command where you wish to insert a delay.
11. Press the **DELAY** button. The DELAY LED will light.
12. Enter the desired delay time (see Programming Delays, step 3).
13. Press **CNCL once** to exit delay mode. The DELAY LED will go off indicating the delay is now stored. You may now STEP to the next command.
NOTE: If you wish to step through the sequence again for further checks and editing, you will need to repeat the editing process from step #1.

When you have finished editing, press **CNCL twice** to exit the EDIT mode. You may now press the edited button to check for proper operation.

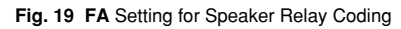
Editing the 2nd Tier

14. Press **CNCL, CNCL, EDIT, target** button, **CNCL, target** button. You are now in the 2nd tier.
15. Edit this tier in the same manner by following steps 3 through 13.

Speaker Relay

Each of the PM110 and LM110 modules has a speaker relay built into it permitting local speakers to be muted independently of speakers in other rooms. The relays are controlled in two ways - internally coded (non-IR) to any desired button on the keypad and with Xantech **RC68+** (or **RC68**) Programmer (optional) IR commands. The IR codes can be taught to a learning remote or to a keypad, if desired.

The relay will respond to commands for **MUTE ON** (sound off), **MUTE OFF** (sound on), and **MUTE TOGGLE**. Since the relay is switching speakers in the local room where the ON/OFF condition is audibly discerned, the MUTE TOGGLE command would most often be used. However, the MUTE ON and MUTE OFF (pair) commands are also made available, to allow a user to control other rooms (i.e., children's rooms) from a central location (i.e., parent's room) with a known ON or OFF condition.



1. Connect the keypads for the zone onto a common IR bus (network) along with an IR receiver as shown in **Fig. 20**. Be sure the system is powered.



2. If you have not already done so, set each SmartPad₃ to a **unique NETWORK ADDRESS** such as 0, 1, 2, 3, etc. (**Fig. 21**).
3. Set the **WRITE/PROTECT** switch to **WRITE** on the 1st keypad (i.e., the PM110 keypad with Network Address **0**) and **press RESTORE** button.
4. Set the rear switches on the back of an RC 68 or RC68+ to **FA**.
5. Direct the RC68 toward the IR receiver and **press it's upper left-most key**. See **Fig. 22**.
6. The active **Source** (bank) button LED on the SmartPad₃ **will flash four times**.

- Within 3 seconds, press the button on the SmartPad₃ where you want Relay **Mute ON** (i.e. a MUTE ON button. See Fig. 24). The active **Source** button LED **will flash twice** to confirm your action.

- Again, within 3 seconds, press the button on the SmartPad₃ where you want Relay **Mute OFF** (i.e. a MUTE OFF button). The active **Source** button LED **will flash twice** to confirm your action followed by **four flashes** to indicate the end of Relay Mute programming for **Address 0**.

The 1st SmartPad₃ has now been coded to respond to the **MUTE ON** and **MUTE OFF** buttons (pair) you selected on the SmartPad₃.

It will **also** respond, over the IR network, to the **#0 ON/TOG** and **OFF** IR commands from the RC68+ (or RC68) set to the default Code Group **D8**. Refer to Figs. 22 & 23.

- Test the IR commands by setting the rear switches on the RC68 to **D8** (the factory default Code Group setting for the SmartPad₃).
- Pressing the **#0 ON/TOG** IR command on the RC68 should cause the Relay to **MUTE ON** (if OFF). Pressing the **#0 OFF** button should cause the Relay to **MUTE OFF** (if ON). Refer to Fig. 22.

Programming the remaining SmartPad₃'s

Each remaining keypad will need to respond to unique muting commands, otherwise muting one room on the IR network with the RC68 IR commands, will mute all the rest as well.

Since any PM110 can store unique coding for up to 16 addresses, we will use the 1st keypad to program codes for the rest, as follows:

- On the 1st keypad (PM110), change the **NETWORK ADDRESS** switch to match an address of the next keypad in the system (i.e., **1**) then press **RESTORE** on the 1st keypad.
- Repeat steps 4 through 8.
- Repeat steps 11 and 12 for each of the remaining addresses you have for the rest of the SmartPad₃'s.

IMPORTANT: You **must** press **RESTORE** each time you change the **NETWORK ADDRESS** in step 11.

At this point the coding that causes each keypad to respond to its own mute buttons and to the unique RC68 commands over the IR Network, for each keypad address, is stored in the 1st keypad. To transfer this coding to the rest of the keypads, do a Network Transfer as follows:

- Set the **WRITE PROTECT** switch to the **WRITE** position and press **RESTORE** on all keypads.

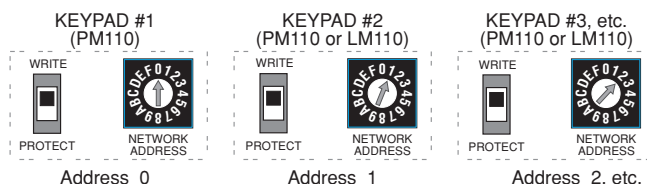


Fig. 21
Set Each Keypad to a Unique Network Address

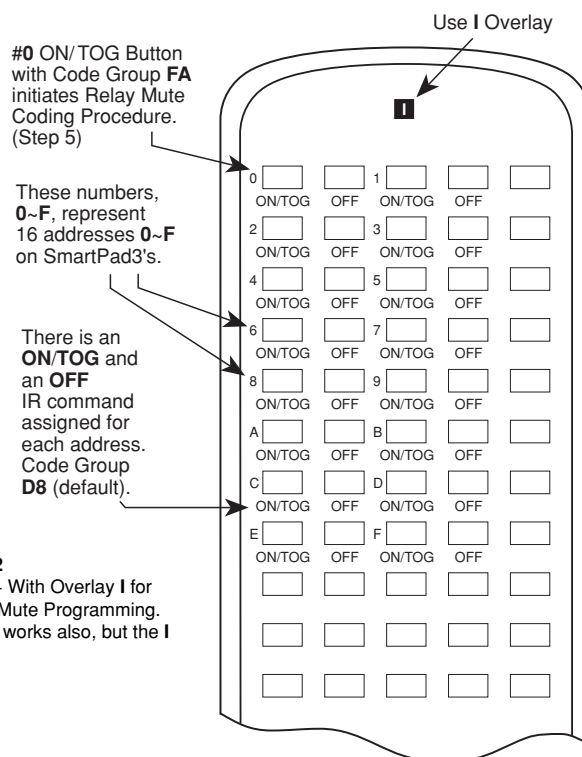


Fig. 22
RC68+ With Overlay I for Relay Mute Programming. (RC68 works also, but the I

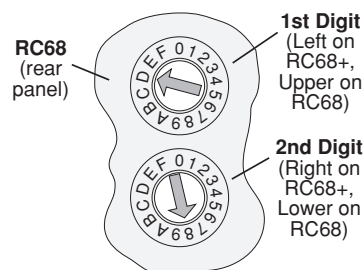


Fig. 23
D8 Default Code Group Setting for SmartPad₃

15. Press **XFER**, then **SEQ** on the 1st keypad.

The SEQ, PGM and NETWORK LED's will blink until the transfer completes. (On LM110's the Source and NETWORK LED's blink).

16. You may now test the Mute buttons that you chose on each keypad to determine proper functioning. Refer to **Fig. 24**.

Also, test each unique IR command from the RC68 (refer to steps 9, 10 and **Fig. 22**) to see that each keypad's relay responds individually and correctly.

NOTE: The active Source (bank) LED will blink Off every 2 seconds to remind you when the relay is in the **MUTE ON** mode.

17. The final step would be to teach the related RC68 ON/TOG and OFF IR commands into learning remotes, such as URC-2's, dedicated to each room.
18. A master SmartPad₃ could also be programmed (on different buttons than its own relay muting) for control of ON/OFF relay muting in a different (i.e. child's) room.

Programming for the TOGGLE command only

If you do not need the MUTE ON & MUTE OFF (paired) commands, you can simplify the process. The single TOGGLE command, for instance, would work well under the MUTE button in a system such as that in **Figs. 5 & 6**. To program Toggle only, proceed as follows:

19. Begin by following steps 1 through 7.
20. At this point, simply wait for the active **Source** button LED to **flash twice, then four times, without** pressing any more than one key on SmartPad₃. The SmartPad₃ will now only respond to the Relay **MUTE TOGGLE** command from that one key. See **Fig. 24**.
21. Now follow steps 11 through 16 to program the remainder of the Smart Pad₃'s.

Remember, in step 11, to select a **different Address** each time and press the **RESTORE** key.

22. Transfer the programmed contents from the 1st keypad to the rest per steps 14 ~ 16.
23. The final step would be to teach the related RC68 ON/TOG (Toggle) IR command into learning remotes, such as URC-2's, dedicated to each room.

NOTE: The internally coded (non-IR) Relay Mute commands are active on tier 1 only. You can, however, program other product IR commands on both tier 1 and 2 on the same Relay Mute button.

Code Group Programming

The SmartPad₃, like certain other Xantech products, has the ability to be set to various IR Code Groups. This allows all keypads on the same zone (IR Network) to respond individually to Bank Tracking and Speaker Relay commands, if needed. This means that a keypad that has been changed to a different Code Group will not bank track with others unless they are also changed to the same Code Group. Speaker Relay commands will need to be set up using the new Code Group as well and will therefore operate independently of other keypad Speaker Relays.

CAUTION: Unless you have a very specialized application, it is recommended that you do not attempt to change the Code Group from the factory default setting of **D8**.

If needed, however, change the Code Group as follows:

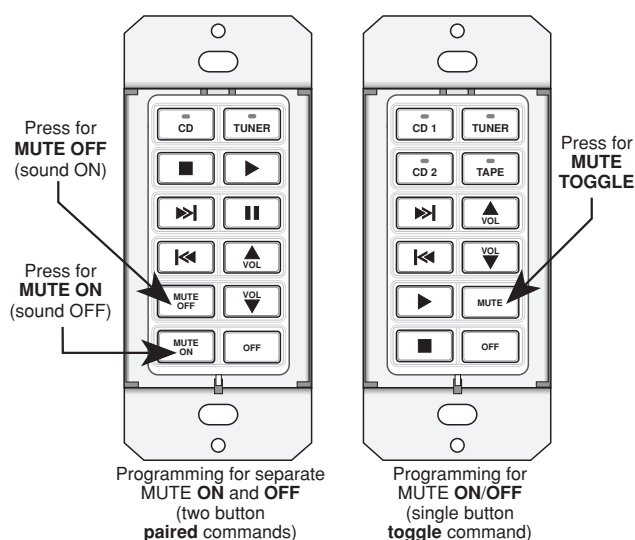


Fig. 24
Typical Selection of Mute Buttons on SmartPad₃ for Relay Paired or Toggle Mute Commands.

1. Connect the keypads for the zone onto a common IR bus (network) along with an IR receiver as shown in **Fig. 20**. Be sure the system is powered.
2. If you have not already done so, set each SmartPad₃ to a **unique NETWORK ADDRESS** such as 0, 1, 2, 3, etc. (**Fig. 21**).
3. Set the **WRITE/PROTECT** switch to **WRITE** on the 1st keypad (i.e., the keypad with Network Address 0) that you wish to change and press the **RESTORE** button.
4. On all the other keypads, set the **WRITE/PROTECT** switch to **PROTECT**.
5. Set the rear switches on the back of the RC 68 or RC68+ to **FF**.
6. Direct the RC68 toward the IR receiver and press a key that reflects the desired Code Group.
CAUTION: Do not choose a Code Group that is the same as other Xantech products that you may have in the same IR system.
7. The active Source (bank) button and NETWORK LED's on the SmartPad₃ **will flash once** indicating that the change has taken place.
8. Repeat steps 3 through 7 for any additional keypads you wish to change.

The factory default value of **D8** can always be returned to by pressing D8 in the above process or by doing a CLR MEM (**Fig. 15**). Be aware that CLR MEM will erase all user programming!

Bank Tracking Programming

Each Source (bank) key of the SmartPad₃ can be programmed to output one of up to 16 different Bank Tracking commands. This is useful if you want a different arrangement of source buttons in one room compared to another but still retain bank tracking between them, or to work more logically with the fixed source keys of a handheld learning remote. To program different tracking commands, proceed as follows:

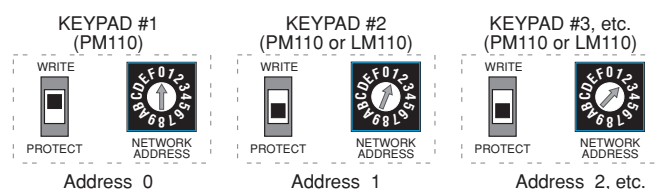
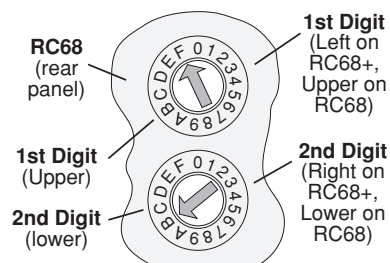


Fig. 25
Set Network Address & Write/Protect Switches

Fig. 26
FB Setting for Bank Track Changes



1. Connect the keypads for the zone onto a common IR bus (network) along with an IR receiver as shown in **Fig. 20**. Be sure the system is powered.
2. If you have not already done so, set each SmartPad₃ to a **unique NETWORK ADDRESS** such as 0, 1, 2, 3, etc. See **Fig. 25**.
3. Set the **WRITE/PROTECT** switch to **WRITE** on the 1st keypad (i.e., the keypad with Network Address 0) that you wish to change and press the **RESTORE** button.
4. On all the other keypads, set the **WRITE/PROTECT** switch to **PROTECT**. See **Fig. 25**.
5. Next, press the Source (bank) key you wish to change.
6. Set the rear switches on the back of the RC 68 or RC68+ to **FB** per **Fig. 26**.

At this point, 16 default codes are available for rearrangement, if needed, labeled on the surface of the buttons on the RC68 or RC68+ as 10 (80 on RC68+), 48, 01 (10 on RC68+), 90, 00, C0, 50, D0, 40, A0, 30, B0, 20, E0, 70, & F0. See **Fig. 27**.

The first 8 relate, in left to right order, to the 2, 4, 6 & 8 banks currently available on the SmartPad₃ key modules (KM2, KM4, KM6 & KM8). Refer to **Fig. 27**.

Use the first 8 when you want to make bank tracking changes so that source tracking will agree between keypads with different source button arrangements.

Use the 2nd 8 if you want to bank track between certain keypads but not with the others.

7. Direct the RC68 toward the IR receiver and press a key that reflects the desired choice. The active Source (bank) button and NETWORK LED's on the SmartPad₃ **will flash once** indicating that the change has taken place.
8. Repeat steps 3 through 7 for any additional source buttons you wish to change.

The factory default set of tracking codes can always be returned to by reprogramming the 10 through D0 codes in order using the above process or by doing a CLR MEM (Fig. 15). Be aware that CLR MEM will erase all user programming!

Fig. 28 will serve to illustrate a typical example.

- Keypad #1 is a simple 2-source version, using a KM2.
- Keypad #2, in another room, has 4 sources using a KM4, with CD and TUNER in different locations.
- To have the CD and TUNER sources bank track correctly between the two keypads, all that is needed is to place the Bank 3 code (01 from the RC68) into the CD bank of the #1 keypad and Bank 4 code (90 from the RC68) into the TUNER bank of the #1 keypad.
- To do this, follow the previous procedure, steps 1 through 8.
- Now, pressing CD or TUNER on either keypad will result in them tracking together.

Command Transfers (Cloning)

All the commands stored in a PM110 may be transferred to another PM110 (or to an LM110 where applicable) in two ways - via the **COM Ports** or by **Network Transfer**.

COM Port Transfer

You would do a **COM** Port transfer when you need to clone one keypad at a time. This would apply to zoned systems where the keypads are **not** connected on a common IR bus (network) but you want each keypad programmed identically. Proceed as follows:

1. Using the 3' cable supplied with the PM110, simply plug it into the **COM** Port of each unit as shown in Fig. 29.

NOTE: You can make transfers with or without the key modules installed on the PM110's.

2. Be sure **both** units are powered before proceeding.
3. Set the **WRITE/PROTECT** switch to the **WRITE** position on the unprogrammed unit. Fig. 29.

NOTE: Transfers can be made from the programmed unit with its WRITE PROTECT switch set to either the PROTECT or WRITE position. However, it is recommended that it be set to the PROTECT position to prevent unintended alteration or erasure of programmed contents.

4. Press the **XFER** button on the programmed unit. Both PGM and SEQ LEDs will flash.
5. Press the **PGM** button. The PGM and SEQ LEDs will flash while a copy of the memory contents are transferred to the unprogrammed unit. You may "clone" as many keypads as desired by repeating this process.

NOTE: If transfer does not complete or the ERR LED shows, remove power from both units, reapply power and try again.

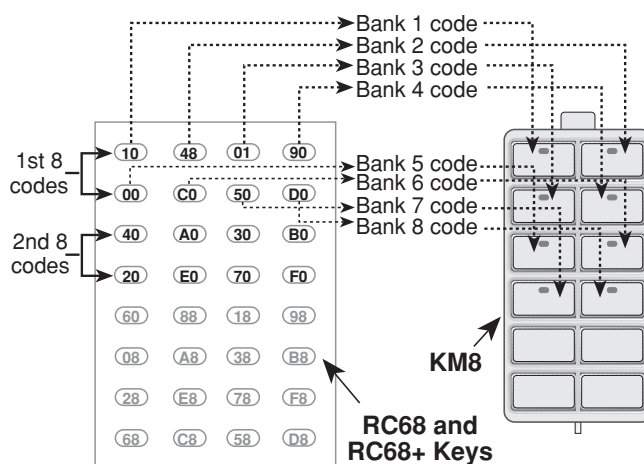


Fig. 27 Default RC68 Bank Tracking Codes

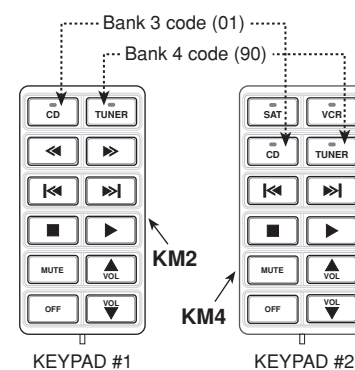


Fig. 28 Bank Tracking Example

- When done, set the **WRITE/PROTECT** switch to the **PROTECT** position on all keypads.

Network Transfer

Network Transfer greatly facilitates the cloning of keypads when you have a number of keypads on the same IR bus (network), up to a maximum of 16. This would apply to multi-room single zone systems, or to multi-zone systems where you may have two or more keypads per zone. Even in multi-zoned systems, you could make up a temporary common IR network by using one or two CB18 Strip-IR's, rather than cloning each one individually (refer to **Fig. 31**).

To perform a Network Transfer, proceed as follows:

- Connect up to 16 keypads onto a common IR bus (network). Refer to **Fig. 31**. Be sure the system is powered up.
- If you have not already done so, set each SmartPad₃ to a **unique NETWORK ADDRESS** (**Fig. 30**) such as 0, 1, 2, 3, etc.

NOTE: The programmed keypad from which the commands are cloned could actually be a 17th keypad, if necessary, and it does not need to have a unique address.

CAUTION: All unprogrammed keypads **must** be set to a different address for cloning to be successful.

- Set the **WRITE/PROTECT** switch to **PROTECT** on the programmed unit (keypad #1) and press its **RESTORE** button.
- On each of the other keypads, set the **WRITE/PROTECT** switch to **WRITE** (**Fig. 30**) and press the **RESTORE** button.

NOTE: Once you have performed steps 1 through 4, you can make transfers with or without the key modules installed on the PM110's or LM110's.

- Press the **XFER** button on the programmed unit. Its PGM and SEQ LEDs will flash slowly.
- Press the **SEQ** button. The PGM, SEQ, NETWORK and one Source (bank) LED will flash quickly on the unprogrammed units until the transfer completes.

NOTE: If transfer does not complete, the process stops and the sending unit will flash its ERR LED at a 2 Hz rate. If this occurs, remove power from all units, reapply power and try again.

- If, for any reason you do not want all units to receive the cloning signal, simply set the **WRITE/PROTECT** switch to **PROTECT** on such units.

NOTE: You may stop the cloning process at any time by pressing any keypad's RESTORE button.

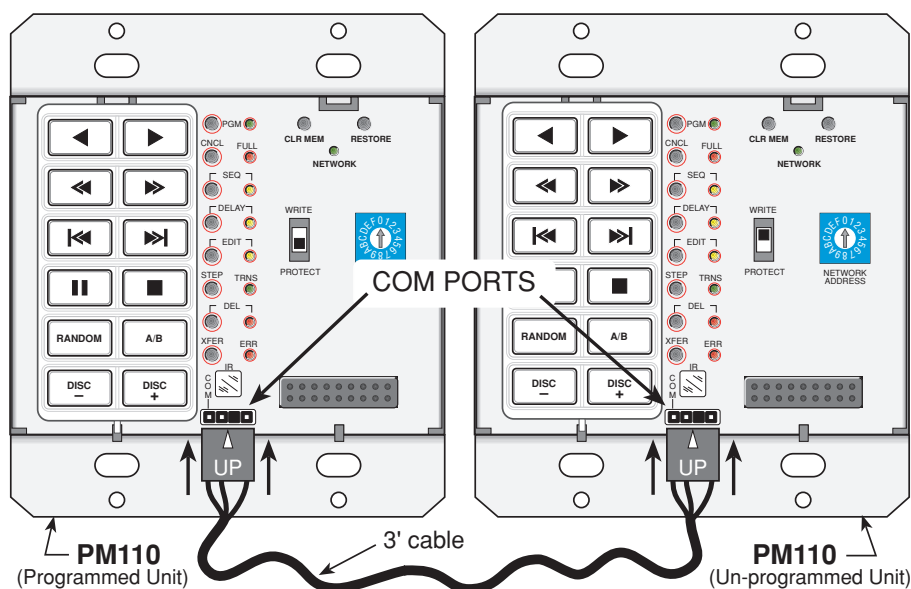


Fig. 29 PM110 to PM110 COM Port Transfer (Cloning)

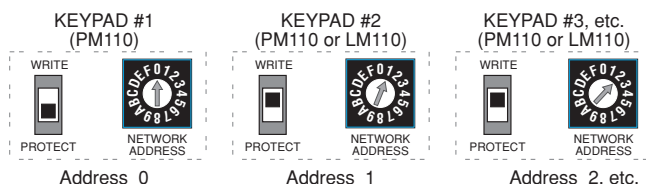


Fig. 30

Set Each Keypad to a Unique Network Address

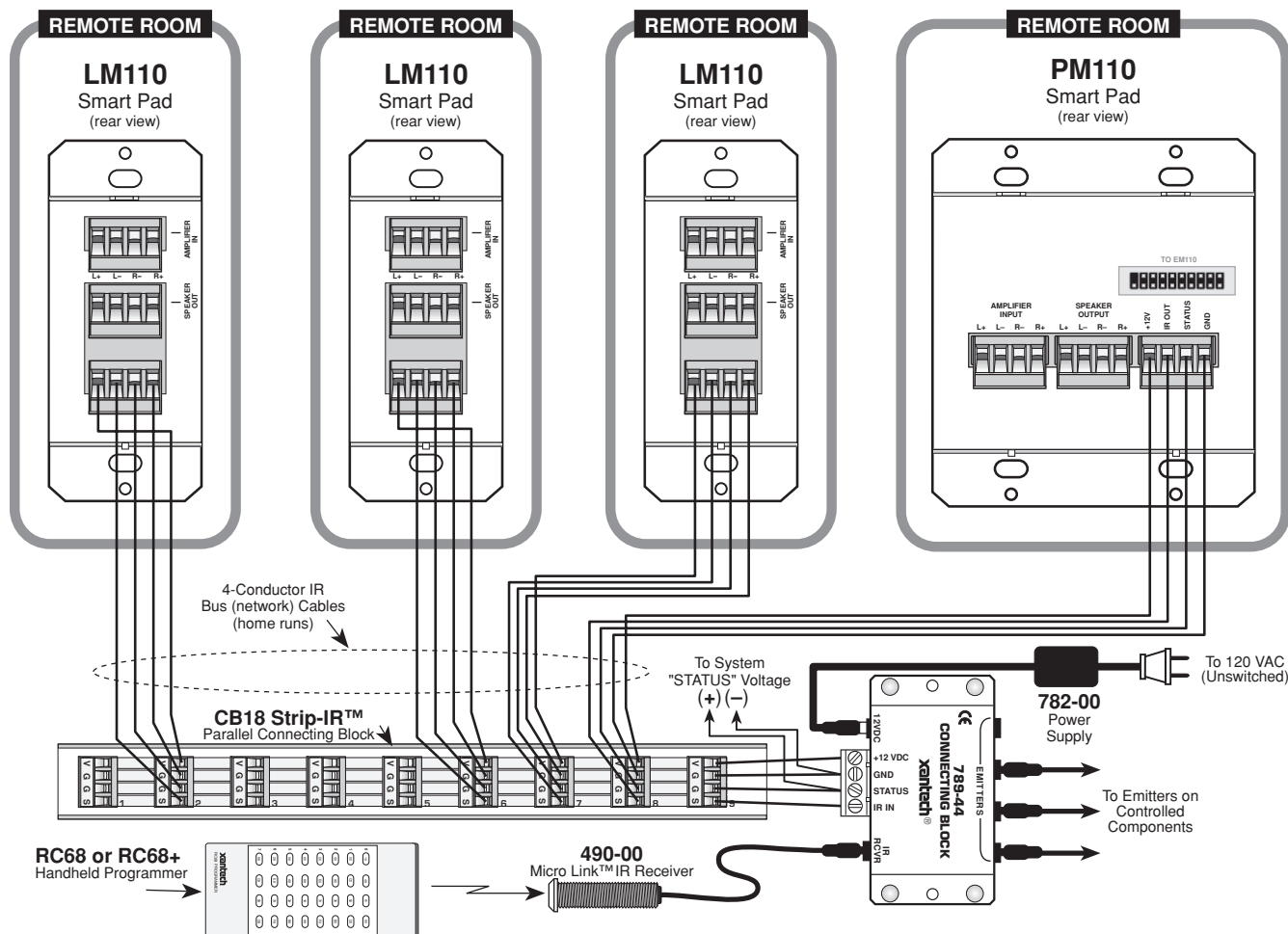


Fig. 31 PM110 to LM110's Network Transfer (Cloning)

- When done, set the **WRITE/PROTECT** switch to the **PROTECT** position on all keypads to prevent unintended alteration or erasure.

Cloning Transfer Time

The time it takes to complete a cloning process depends on the amount of data required for the project and the number of keypads. For instance, a small project using only 2k of memory transfers in 10 seconds to a single keypad and an additional 1 to 2 seconds for every additional keypad. A very large project that uses all of the available 32k of memory requires 105 seconds plus 10 seconds for every keypad that becomes a clone. The maximum time, therefore, for 16 units to become clones would be 265 seconds (4 minutes, 25 seconds).

CAUTION: With either COM Port or Network Transfer, the down-line unit(s) have no choice in what they accept. Any commands that currently exist in the down-line units will be erased and completely replaced by the new data. *All previous programming will be lost!*

Clearing all Memory

If, for any reason, you wish to clear all programming from the keypad, set the **WRITE/PROTECT** switch to the **WRITE** position and press **CLR MEM** button **twice** within 1 second (PM110). The active Source (bank) LED will blink once to confirm the action.

- Bear in mind that **all previous programming will be lost!**
- You may now proceed to reprogram the keypad from scratch.

NOTE: The LM110 does not have a memory clear button since the memory is essentially cleared each time a transfer is made to it from a PM110 or Dragon Drop IR™. Simply pressing RESTORE (or removing and reapplying power), before data transfer, will normally clear any problems related to LM110 memory conditions.

Exceeding Memory Limits

With the large memory capacity of the PM110 at 32k and the LM110 at 8k, it is unlikely that you will ever exceed the limit, especially when manually programming. If you should exceed the limit, however, the FULL indicator will light on the PM110. If you try to transfer more than 8k to the LM110, the PM110 ERR LED will light at the beginning of the transfer. In either case, you will have to press RESTORE on both units and then "off-load" some commands and rearrange your project to stay within the memory limits.

MOUNTING

The SmartPad₃ system mounts in standard one, two and three gang "J-box" configurations, in basically the same way as other wall mounted decorator style components. A few things to keep in mind are as follows:

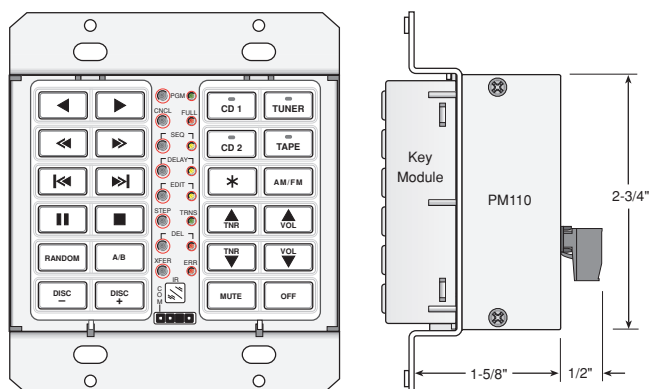


Fig. 32

PM110

(shown with a KM1F & a KM4)

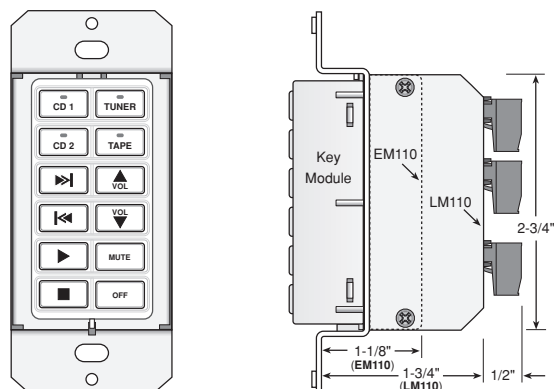


Fig. 33

LM110/EM110

(shown with a KM4)

- The PM110 and LM110 require considerable room in the J-box.
- For retrofit (existing construction) applications, use high volume boxes, such as the 2-gang Slater Retrofit 32 cu. inch box, or Xantech's Model SLB2 2-gang retrofit box.
- For new construction, most high volume J-boxes will work. A "P" ring could also be used.
- **NOTE:** Be sure to check fit **before** buying large quantities of J-boxes or P-rings for the job.
- Avoid high moisture applications such as showers, steam rooms or outdoor locations. For such applications, use Xantech's **"THE WATERPAD™"** (a membrane version of the SmartPad₃).

TROUBLE SHOOTING

If you encounter problems, review each of the following items and take corrective action as described. If problems persist, contact Xantech Technical Support.

1. **Unit freezes or locks up while learning IR commands.** The **ERR** LED may stay on constantly.
 This can occur if you hold the "teaching" remote too far away from or at too great an angle to the face of the IR window of the PM110. It may also occur if there is IR interference present.
 Do the following:
 - a) Press the **RESTORE** button and repeat the learning procedures for that particular key. Be sure the remote is held 1/2" to 1" away from the **IR** window on the PM110.
NOTE: Pressing RESTORE sets the internal program of the PM110 back to the start position. It does *not* erase user-programmed commands.
 - b) Be sure there are no sources of strong IR interference (such as CFL lamps, TVs, Neon lighting, etc.) near the PM110. Shade the IR window of the PM110 if necessary.
2. **The 2nd keypad, after a Full Memory Transfer, does not output IR commands.**
 Corrupted data in the 2nd keypad may have prevented a proper data transfer.
 - a) Press the **CLR MEM** button *twice* on the 2nd keypad.
 - b) Repeat the **Command Transfers (Cloning)** procedure (page 36).
3. **Unit will not learn IR commands from certain brands and models of remotes.**
 - a) Some IR commands are not learnable by the SmartPad₃ or the Dragon Drop-IR system. ***Be sure to test all components first to see that their IR command codes are learnable and executable by the SmartPad₃ before selecting final components for the system.***
 To aid you in this selection, see CAUTION card (included) for the latest information relating to incompatible codes.
NOTE: Certain IR commands not learnable directly by SmartPad₃ are available on the Xantech Web Site and on CD ROM for use in Dragon Drop-IR. Contact Technical Support for details.
 - b) High frequency IR carriers above 71 kHz also cannot be learned directly. Some may be learnable, however, when down-converted by Xantech products such as the 291P, PMS12, 291-455, MS455, etc.

Refer to the Xantech Product Catalog and contact Technical Support for details. Be sure you have the Make and Model number of the component and its remote before contacting Technical Support.

Memory: LM110 8 kbytes E² PROM
 PM110 32 kbytes E² PROM
 IR Carrier Frequency: 31.25 kHz to 71.50 kHz
 Power Requirements: 12V DC (75 mA without STATUS - 85 mA with STATUS)
 (Requires Xantech 782 Power Supply)
 Connector: 4-screw terminal block: +12V, STATUS, GND and IR OUT
 Conductors: Normal 3-wire Xantech IR receiver system compatible
 (4th wire for STATUS indication)
 Cable Requirements: Four-conductor/24 gauge up to 150', 22 gauge up to 400', 20 gauge
 up to 1500' and 18 gauge up to 4000' (unshielded OK)

NOTE: The Smart Pad₃ will not operate in the 2-wire Phantom Power Mode.

Maximum peak IR signal output current:..... 100 milliamps

STATUS Terminal Power Management Turn-on Voltage: 5 to 30 volts DC
(8mA @ 12V DC)

COM Port: RS232 Signal Compatible

Speaker Relay:..... Stereo Speaker Pair Muting

Contact Rating: 2 Amps/30V DC
(Will handle amplifiers rated up to 100W/channel)

IR Commands ON, OFF, TOGGLE (RC68 Code)

Factory Default Speaker Relay IR Command #10 Button on RC68, Toggle

Factory Default Code Group Setting **D8**

Depth behind mounting plate (including terminals): PM110/LM110: 2-1/4" (57 mm)
EM110: 1-1/8" (29 mm)

- Modules will fit one, two and three-gang boxes for both new and existing construction •
 - Modules fit standard decorator-style wall cover plates (not included) •
 - Key modules and buttons are available in white, ivory and black •

PATENT PENDING

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