# *INSTALLATION INSTRUCTIONS*

## 796-20
## SIX ZONE CONNECTING BLOCK/EXPANDER

The Model 796-20 is a Six Zone Connecting Block that allows IR control of elaborate multizone audio/video systems. It serves as an expansion module for the 795-20 or, by itself, as a six zone block. Expansion beyond 6 zones can be achieved with multiple 796's, limited only by IR noise considerations. The zone input terminals permit the connection of any Xantech IR Receiver, Keypad or controller device. Each zone output can control 2 or more pieces of equipment per zone, independent of the other zones, via single or dual emitters or be direct wired to the IR input of Xantech Preamps, etc. The common output port can drive 1 single or 1 dual emitter or the IR input of Xantech Connecting Blocks for control of common source equipment from any zone. The 796-20 utilizes active isolation devices for elimination of internal zone-to-zone cross-talk as well as high speed amplification to all output ports for operation with a wide range of IR controlled products.

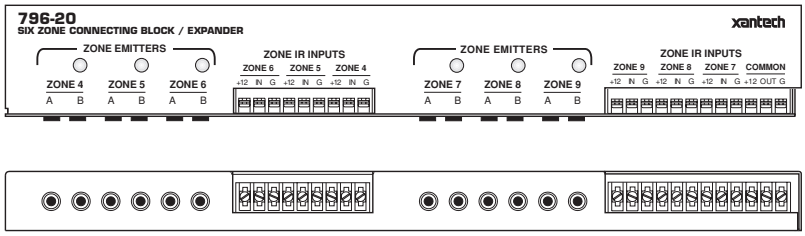


*Fig. 1 Model 796-20 Six Zone Connecting Block/Expander*

## SPECIFICATIONS

- Zone IR Inputs: Six 3-screw terminal connectors to interface with all Xantech 3-lead IR receivers and/or keypads.
- Outputs: 12 Zone emitter ports (3.5mm mini mono jacks) and 1 common port (screw terminals).
- Green LED test indicators are connected in series with the zone outputs. They will only light when the connected emitter or device is conducting current.
- Zone output ports A and B and the common port are parallel driven and have a 470-Ohm resistor in series with each port for lower power operation. This prevents overload of IR sensors on A/V components and also allows the use of models 282, 283, 284 & 286 series Mini Emitters, Xantech Controllers, Preamps, etc. in any combination.
- Power requirements: 12 volts DC. Use 781RG or 782-00 Power Supplies.
- Power is applied via the **+12 & G** of the common terminals (see **Figs. 2-4**).
- Dimensions: 13-3/8" W x 1-7/8" D x 1" H

## INSTALLATION

**Fig. 2**, illustrates a typical installation using the 796-20 in a six zone system. A variety of Xantech IR Receivers and a keypad are shown in the various zones. When configuring a system, please keep the following items in mind:

1. Additional IR Receivers may be wired in parallel at each zone input, if desired, up to a total of twelve. More than twelve is not recommended, even in a zoned system, because stray IR noise picked up by the many IR receivers may cause erratic operation and reduce remote control range.

**Note:** Because the 730-00 Smart Pad keypads are not IR receivers, this restriction does not apply to them. They may be added virtually without limit, provided power supply requirements are taken into consideration. See item 3 below.

2. Be sure to connect the **+12V**, OUTput and Gnd of each IR receiver and keypad to the respective +**12**, **IN** and **G** terminals of the zone inputs as shown.
3. **Power Supply Requirements.** In elaborate installations you may combine many Xantech keypads, IR receivers, controllers and emitters in a system. Having sufficient power supply voltage and current available can be critical to achieve proper operation. To be sure you have adequate power supply capability, take the following factors into consideration:
   a) The maximum current available from a 781RG Power Supply for proper operation is 200 mA (milliamps).
   b) The maximum current from a 782-00 Power Supply is 1000 mA.
   c) Most IR receivers draw 2 mA without signal and 10 mA with signal. Refer to the IR receiver's spec's for actual value.
   d) Each 730-00 keypad draws 7 mA without signal and 65 mA with signal. The SmartPad$_2$ draws 85 mA, with or without signal.
   e) Each emitter connected to the Zone and Common Ports of the 796-20 draws 3 mA with signal and 0 mA without.
   f) Add 10 mA for each Xantech powered accessory, such as the 794/797 Interface modules, 791-44 Amplified Connecting Blocks, etc., <u>if</u> they are powered from the 796-20.
   g) When using combinations of these devices, add up the currents as shown in the following example. Then choose a power supply that has a maximum available current that is higher than the total current required.

   For example, the power supply needed for the system shown in **Fig. 2** is arrived at as follows:

   h) The no signal current for the 6 IR receivers is 6 x 2 = 12 mA.
   i) The current for the SmartPad$_2$ is = 85mA.

      Note: Since only one IR device normally operates at any given time, only one IR device, the one with the highest current, needs to have its "<u>with signal</u>" current included (in this case, the SmartPad keypad).
   j) The current for one 794-60 Interface module = 10 mA.
   k) The current for one 791-44 Amplified Connecting Block = 10 mA.
   l) The current for 7 emitters at the 791-44 ports is 7 x 3 = 21 mA.
   m) The current for the emitters at the Zone ports is 2 x 3 = 6 mA. (Since all the zone emitters cannot operate the zone equipment at the same instant in time, only one zone is included. In this case we chose zone 5 (or 6), since one emitter and a device are driven ).
   n) Now add up all the currents from steps h) through n).

      12 mA + 85 mA + 10 mA + 10 mA + 21 mA+ 6 mA = 144 mA total. Since this is wqell below 200 mA, one 78RG power supply would suffice.

   If the total current exceeds 200 mA, simply step up to the 782-00 power supply.

   NOTE: To avoid current "hogging", never connect regulated supplies (such as the 781RG and the 782-00) in parallel.

   **CAUTION: Do not use unregulated 12V power supply adapters from other manufacturers.** These may deliver excessive voltage to the IR receivers and cause them to “latch-up”. When this occurs, the “talkback” LEDs in the IR receivers and on the 796-20 Zone Controller may stay on continuously!

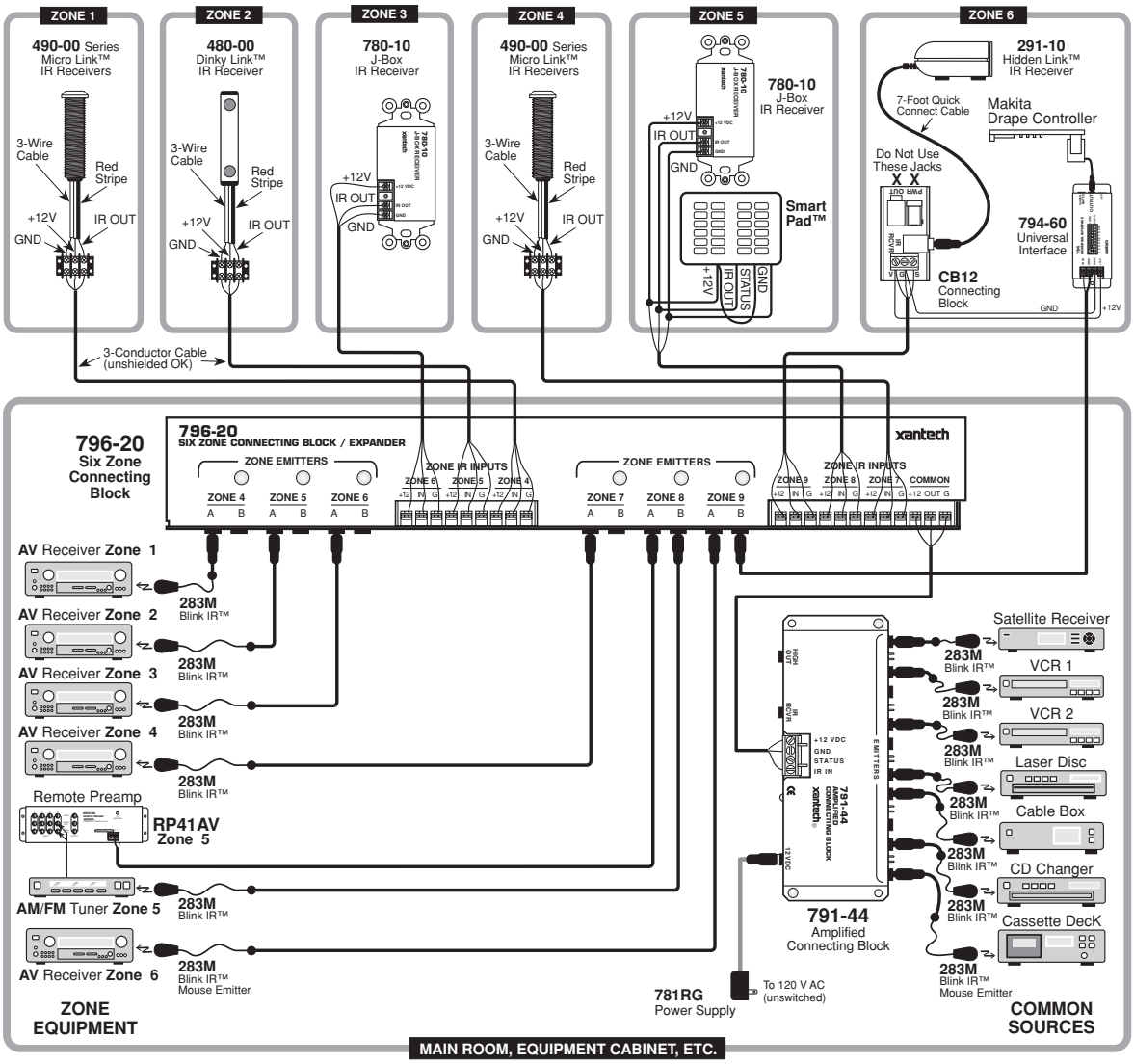


***Fig. 2*** *A Typical 796-20 Six Zone System*

4. The resistors in series with each zone and the common OUT port provides current sharing to each emitter and also allows the use of dual emitters in combination with single emitters. <u>You may, therefore, connect any combination</u> of emitter models 282, 283, 284 & 286 series emitter series to the zone ports and the common OUT port, to control the desired number of components.
5. When using fewer than 10 emitters on the 791-44 (common) emitter ports, you may plug them in without regard to order, as shown in **Fig. 2**.
6. **Considerations for Shielded Wire and Long Lead Lengths.** When using long lengths (>50 ft.) of inter-room shielded cable (> 75 ft. unshielded), it may be necessary to connect a 470 Ohm 1/8 Watt resistor between IR **IN** (signal) and **G** at the 3-screw terminals of the 796-20. Refer to **Fig. 3**.

**Please Note:** The zone numbers for the rooms in **Fig. 2** do **not** agree with the zone numbers marked on the 796-20. The reason for this is that the 796-20 is designed to expand the zones of a 795-20 as shown in **Fig. 4**, in which case the zone numbers do match.

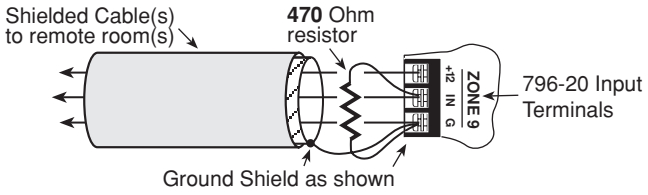


***Fig. 3*** *Using a 470 Ohm Capacitance Discharge Resistor*

### Emitter Expansion

1. Zone Output Ports. Since the 796-20 zone output ports (A and B) are driven in parallel and have a 470-Ohm resistor in series with each, you may expand up to four emitters simply by using two dual emitters, such as the 284-00 or the 286-00.

   To expand beyond 4 emitters, connect a 789-44 Connecting Block or a 791-44 Amplified Connecting Block at the "A" or "B" port to achieve the desire number of emitters. Simply use a 2-conductor cable with a mono mini plug on one end and stripped ends at the other. Connect the signal lead (from tip of the mini plug) to the INPUT terminal of the 789-44 or 791-44 block and the other lead to the GROUND terminal of the block. **Do not use the IR RCVR jack on the connecting blocks for this purpose!** Also, a power supply is **not needed** for the 789-44 when used solely for emitter expansion.
2. When using 791-44's for emitter expansion from the zone ports, you may power them from the **+12** and G terminals on any one of the 796-20 IR ZONE terminals. Be sure to take the current drain of the 791-44's into consideration (10 mA each) and the extra emitters you use, when calculating the total current for choice of power supply.
3. COMMON OUT Port. This may be used to drive one single or one dual emitter to operate common components. When more are required, use the COMMON OUT port to drive the input of a 791-44 Amplified Connecting Block as shown in **Fig. 2**. This allows the use of up to 10 single or 10 dual emitters to control the common sources.

### ZONE CROSS-TALK CAUTION

Be sure to use MS Mouse Emitter Shields (available separately) with the 282M and 284M series emitters, if you use them instead of the 283M's and 286M's. The MS1 will stop the stray IR output of a zone emitter or a common source emitter from bleeding over into another zone or zones. This is especially important when zone receivers and source equipment are stacked close to each other.

## 796-20 AS A ZONE EXPANDER FOR THE 795-20

**Fig. 4** shows the 3-lead connection necessary between the 795 and the 796 for zone expansion of a 795.

- For simplicity, only six zones, 1, 2, 3, 7, 8, and 9 are shown in the diagram. A total of nine zones are possible, each wired with any choice of IR receivers & key-pads, in the same manner as shown in **Fig. 2**.
- Plug emitters into the ZONE EMITTERS A and B jacks as required.
- **NOTE: Do not plug emitters into ZONE 4 A or B on the 795.** Emitters for zone 4 must be plugged into the ZONE 4 A or B jacks on the 796.
- Power is applied to the 796 as well as the 795 via a power supply connected to the +12V jack on the 795. Be sure the current drain of all devices is taken into consideration when calculating the total current for choice of power supply.

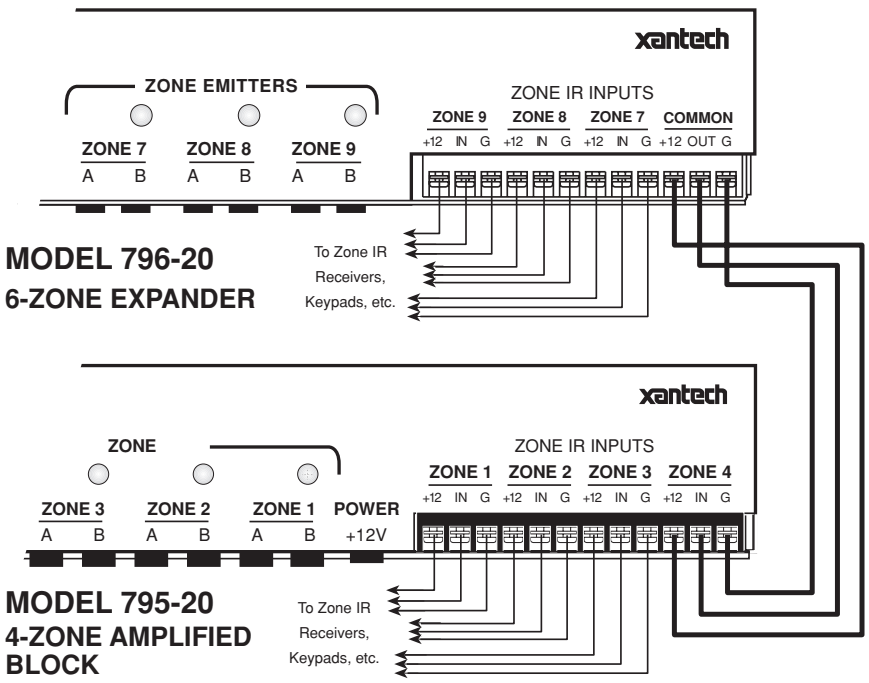


***Fig. 4*** *A 796-20 Connected As a Zone Expander For The 795-20*

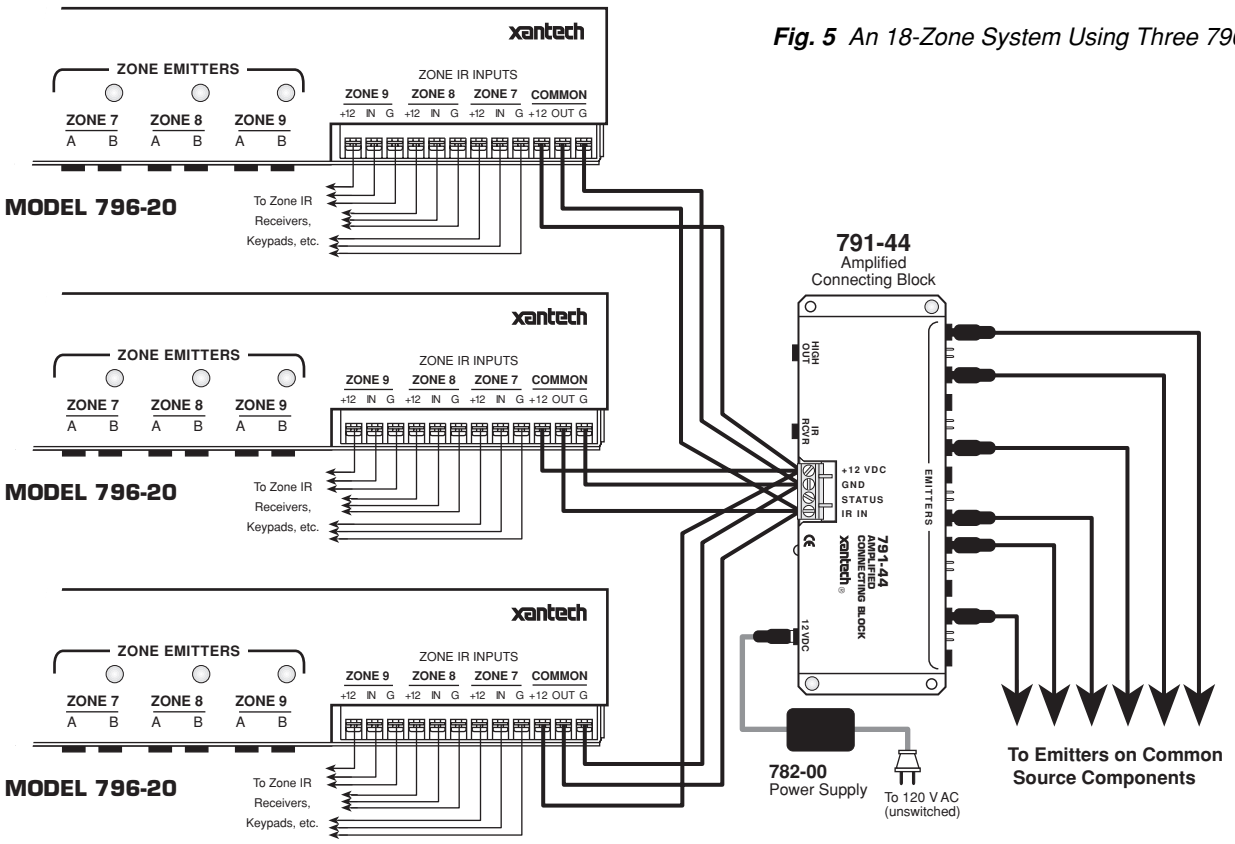


***Fig. 5*** *An 18-Zone System Using Three 796-20's*

## CONNECTING MULTIPLE 796-20's FOR ZONE EXPANSION

**Fig. 5** shows how three 796's may be connected for an 18-zone system. The three wire COMMON connections from each 796 are paralleled at the input of a 791-44 Amplified Connecting Block to drive the common source emitters. Combinations of two or more 796's may be similarly connected to handle virtually any multizone requirement.

- For simplicity, only three zones on each 796, zones 7, 8, and 9, are shown in the diagram. All six zones of each 796 may be wired with any choice of IR receivers and keypads, in the same manner as that shown in **Fig. 2**.
- The maximum number of zones using IR receivers is limited only by stray IR noise considerations. See item 1, page 1.
- Keep in mind that you will need to apply different zone numbers to the 796-20's so they will match the actual zone numbers you assign to rooms.
- Plug emitters into the ZONE EMITTERS A and B jacks as required.
- Power is applied to the system via the power supply connected to the 791-44. Be sure to take the current drain of all devices into consideration when calculating the total current for choice of power supply.

**PLEASE NOTE:** Be sure that the 781RG or the 782-00 Power Supplies, where used, are plugged into unswitched AC outlets. This maintains the IR control system in "standby" operation so that power-on commands can be sent to the equipment.

## MOUNTING

The 796-20 can be conveniently mounted to a wall or shelf by using the four sheet-metal screws and the two right-angle brackets supplied. Fasten a bracket to each end surface of the 796 using the two small black screws, driving them into the holes provided. Use the longer screws to attach the unit to a wall or shelf. The holes in the ends are located so that two different mounting positions are possible. The unit may be mounted in any orientation to accommodate the installation.