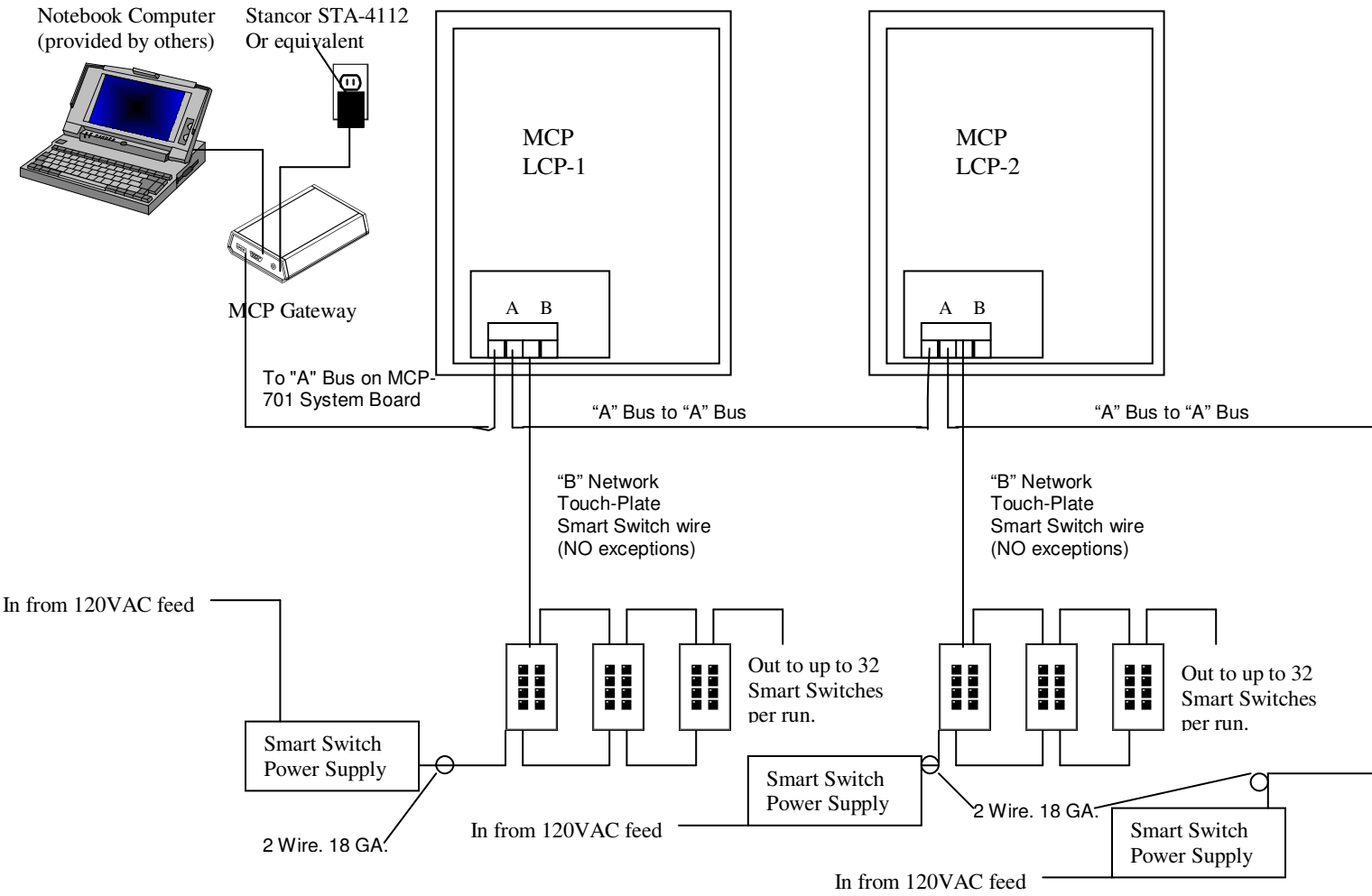
Touch-Plate® Lighting Controls



The Touch-Plate MCP Lighting Control Network

The above illustration is of a working MCP network showing all the main components needed to completely control a residential or commercial lighting control system. The configuration of panels and dimmers may vary according to the lighting control application.

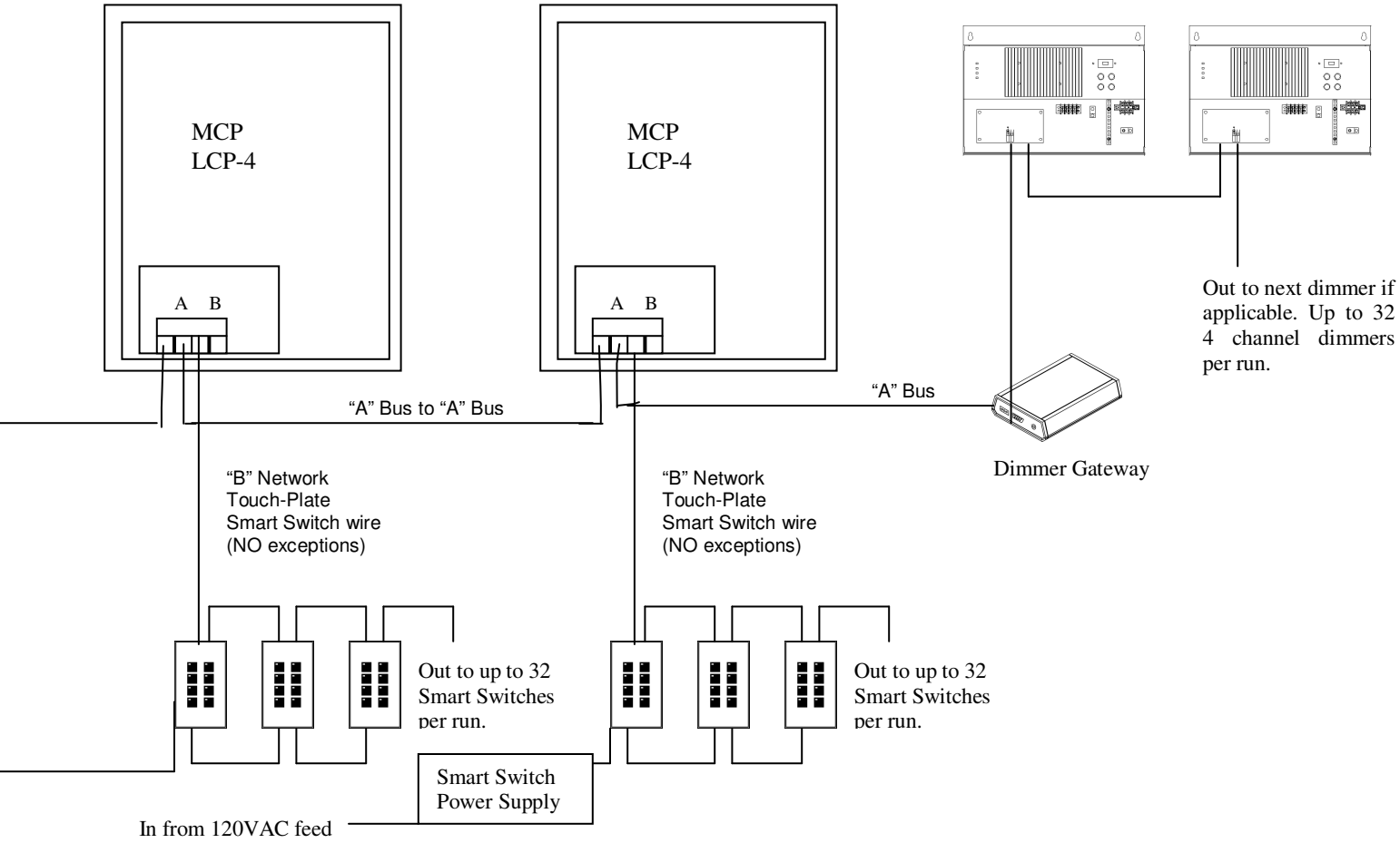
Up to 32 Smart Switch stations may be used per panel regardless of the number of buttons in each Smart Switch. The Smart Switch power supply is only needed when Smart Switches are used. Smart Switches are internally programmable via digital addressing. (See Figure 5.)

The MCD-0004, a 4-Channel Dimmer, and the MCP Dimmer Gateway are only necessary when lighting needs to be maintained at various levels. Up to 32 MCD-0004, 4-Channel dimmers may be used per Dimmer Gateway. The Dimmer Gateway connects to a MCP panel and is used only for dimmers. If you have 0-10V dimmers other than Touch-Plate dimmers, you may use them with a MCP-535A analog card.

Only in the case of two or more panels is a MCP Gateway needed. When used, the MCP Gateway, along with a laptop or desktop computer, is able to control the entire MCP network from any specified panel location. The computer must be **no more than 15 feet** from the MCP Gateway, and the MCP Gateway must be **no more than 1000 feet** away from the MCP panel from which it is controlling the MCP network.

Touch-Plate® Lighting Controls

MCP Network Overview



Connecting MCP Panels Together

Belden 9729 cable is required for networking panels. Panels are connected via the "A" bus on the MCP-701 System Boards inside the panel. The MCP-701 System Board has an "A" bus and a "B" bus. There are four terminal blocks total. The two terminal blocks on the left are for the "A" bus and the two terminals on the right are for the "B" bus. Belden 9729 cable connects from the OUT (right) terminal block on the "A" bus to the "A" bus IN on the next panel to be networked. The procedure is repeated from panel to panel for networking MCP panels together. (See Figure 1 for detailed wiring of panels to each other.)

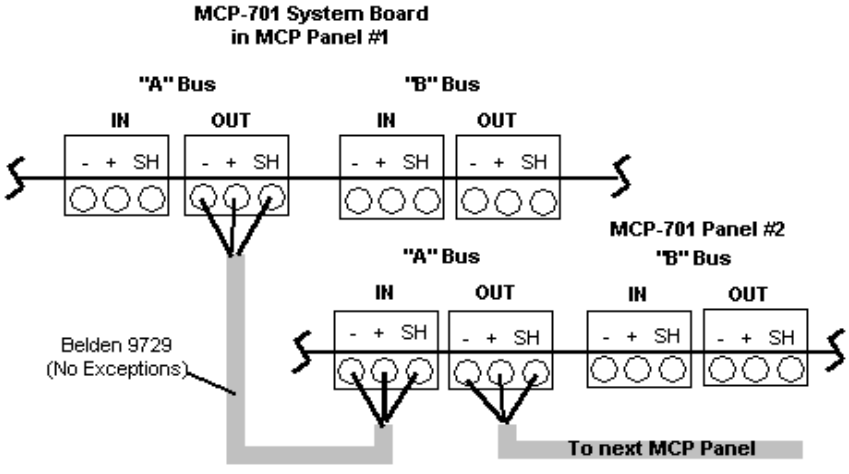


Figure 1 - Connecting MCP Panels Together

The MCP Gateway

To control the network with a computer, you must connect an MCP Gateway to the MCP Network. The Belden 9729 cable connects from the 3-position Phoenix connector on the MCP-Gateway to the IN (left) terminal block on the "A" bus of the first MCP panel in the system to be networked. You must also connect an RS-232 **NULL MODEM** cable from the RS-232 OUT port on the MCP Gateway to the RS-232 IN port (com port) on the computer. This cable is provided along with the MCP Gateway. In addition, for powering the MCP Gateway, a Stancor STA-4112 power supply or equivalent must be used. This power supply is also provided along with the MCP Gateway. (See Figure 2 for detailed wiring of the MCP Gateway to an MCP panel.)

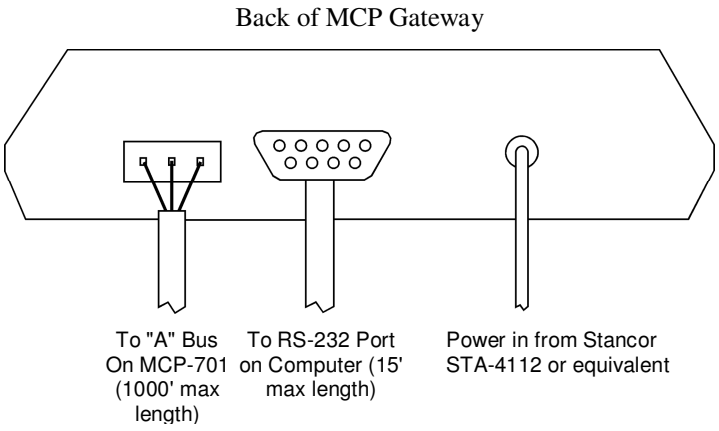


Figure 2 - Connecting the MCP Gateway to a MCP Panel

Smart Switches

When using Smart Switches in a Touch-Plate lighting control system, Smart Switches are connected to the "B" bus on the MCP-701 System Board via Touch-Plate Smart Switch cable. This cable contains 2 unshielded, #18 GA. wires plus 2 #22 GA. wires and a shield, twisted pair. A single jacket encases all wires. The #22 GA. wires and the shield connect to the IN (left) terminal block on the "B" bus. The #18 GA. wires connect power from the Smart Switch Power Supply (required) to the first Smart Switch in a run. These two power wires are jumped from switch to switch. The Smart Switch Power Supply can provide power for up to 32 Smart Switches. Therefore, one power supply is required per run of 32 Smart Switches. (See Figures 3-4a for detailed Smart Switch wiring information. If you are using other switching devices in stead of, or in addition to Smart Switches, see also Figures 7-8, 11-12 and 15-20.)

Once the Smart Switches are connected to the MCP network, they must be addressed using the DIP switches on the back of the Smart Switches. (See Figure 5 for detailed information on Smart Switch addressing.) You will also need to set the terminating resistor DIP switch on the back of the last Smart Switch in the run. This is so the system knows that this is the last Smart Switch. (See Figure 6 for detail of the terminating resistor DIP switch.)

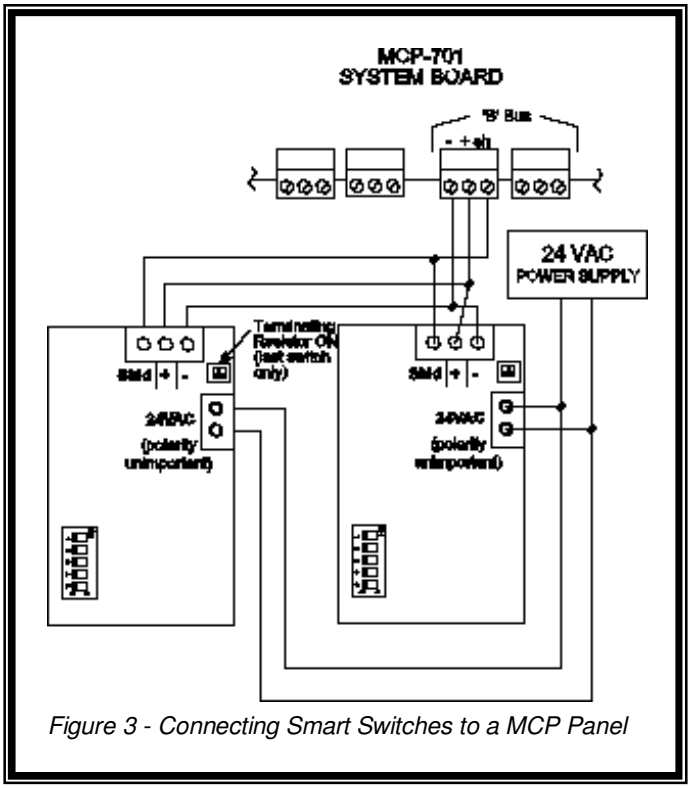


Figure 3 - Connecting Smart Switches to a MCP Panel

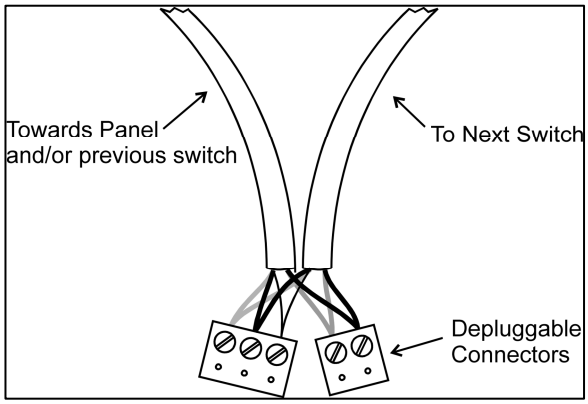


Figure 4 - The Depluggable Connector and How It Connects to the Smart Switch

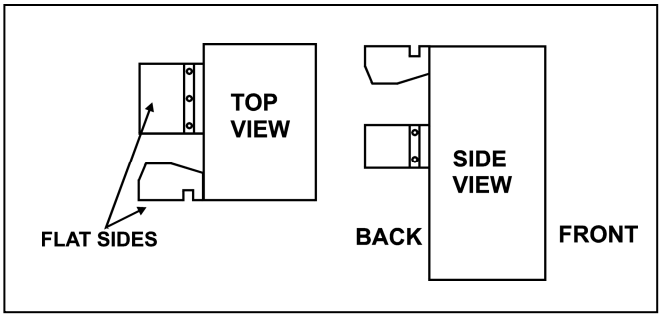


Figure 4a - The Depluggable Connector and How it Connects to the Smart Switch

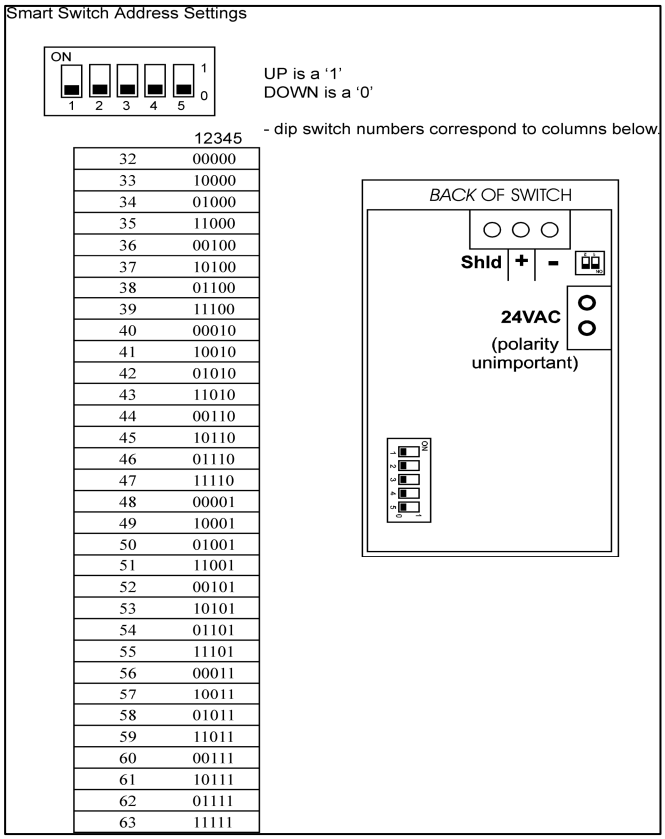


Figure 5 - Smart Switch Addressing

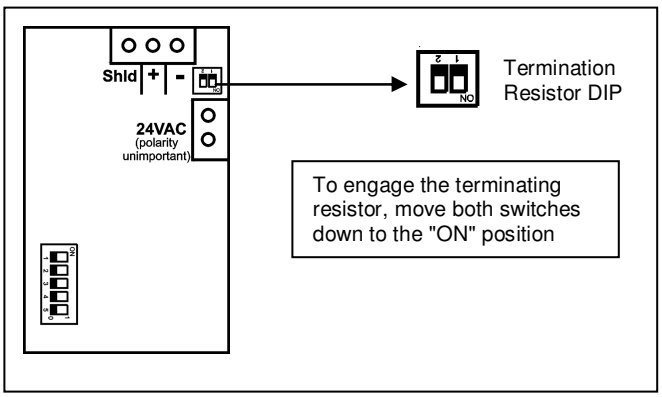


Figure 6 - Terminating Resistor DIP on the Smart Switch

The Smart Switch Terminal

If you are using Smart Switches, and you wish to add standard, Touch-Plate, low voltage switches or other types of low voltage switching devices in remote locations, you can add a Smart Switch Terminal. This device provides inputs for switch and pilot wires as well as their switch common and pilot common wires. This allows you to use regular switches in remote locations without having to run their leads all the way back to the panel. The Smart Switch Terminal takes up the addressing space of one Smart Switch. You can only have 31 other Smart Switches in any run which contains a Smart Switch Terminal. However, if you need switch stations in remote locations, using the Smart Switch Terminal provides termination points for switch leads of regular, low-voltage switching devices without having to run a lot of wires back to an MCP panel. There are two jumpers on the Smart Switch Terminal. You may connect JP1 if you want to short the isolated ground with the circuit ground. Only unique circumstances will require the use of this jumper. JP2 is used to select the LED voltage required by the switches being used. The options for this jumper are 5V and 24V. When looking at the Smart Switch Terminal with this jumper in the bottom left corner, the two pins on the left are for 24V and the two on the right are for 5V. Most switches will require 5V as a general rule. (See Figure 7 for detailed information on how to connect a Smart Switch Terminal to an MCP network and Figure 8 for a detail of the Terminal.)

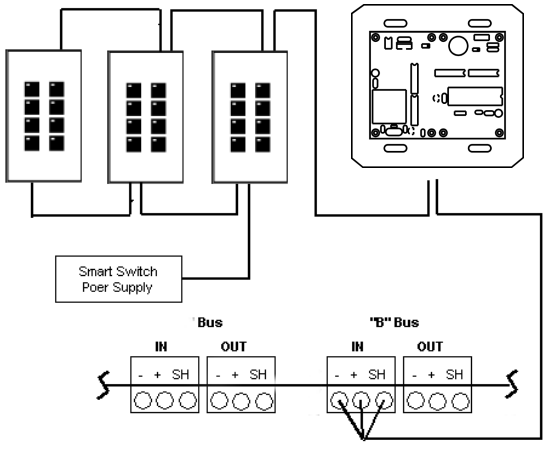


Figure 7 - Detail of Smart Switch Terminal Connection to the MCP Network

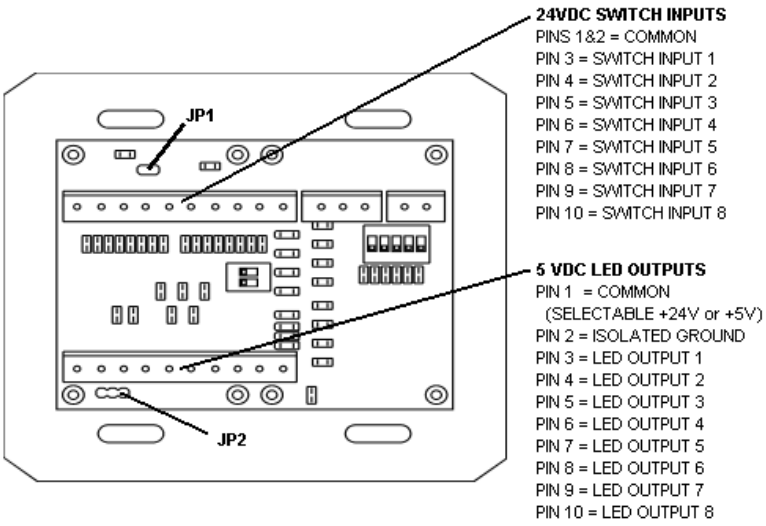


Figure 8 - Detail for connecting the Smart Switch Terminal to the MCP Network

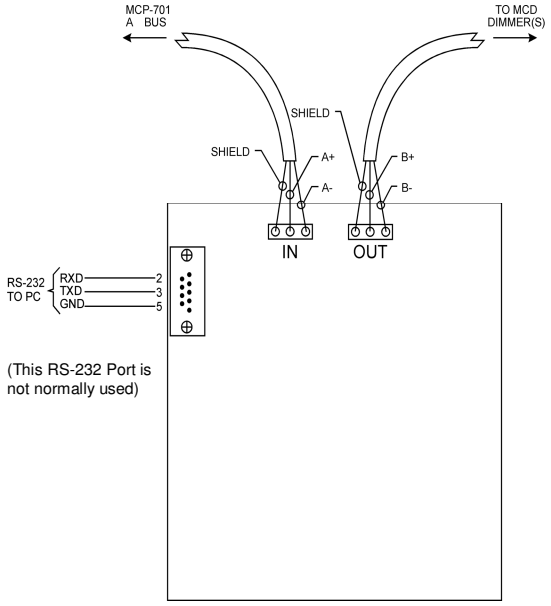


Figure 9 - Detail of MCP Dimmer Gateway Wiring

Dimmers and the Dimmer Gateway

When using MCP series dimmers, along with MCP panels, a Touch-Plate Dimmer Gateway must be used. This device is able to handle up to 32 4-channel dimmers.

To connect the dimmers to the MCP Dimmer Gateway, it is recommended that you use Touch-Plate Smart Switch wire since all the wires you will need are encased in a single jacket. You will need every wire provided by this cable except for the two #18 GA. wires. The two #22 GA. wires and the shield connect from the OUT (right) terminal block on the MCP Dimmer Gateway to the first dimmer in the run and then from dimmer to dimmer using the same terminal block on each dimmer for the IN and the OUT. In other words, the dimmers are “daisy chained” together. To connect the MCP Dimmer Gateway to the panel network, you must run the two #22 GA. wires and the shield back to the “A” bus OUT on the MCP-701 System Board inside the last MCP panel. You may also use Belden 9729 cable to make these connections. After you install the MCD dimmers, you must address them so that the MCP system can find them. (See Figures 9 & 10 for detailed wiring information on the MCP Dimmer Gateway and the MCD dimmers and Figure 13 for a detail on MCD dimmer addressing.)

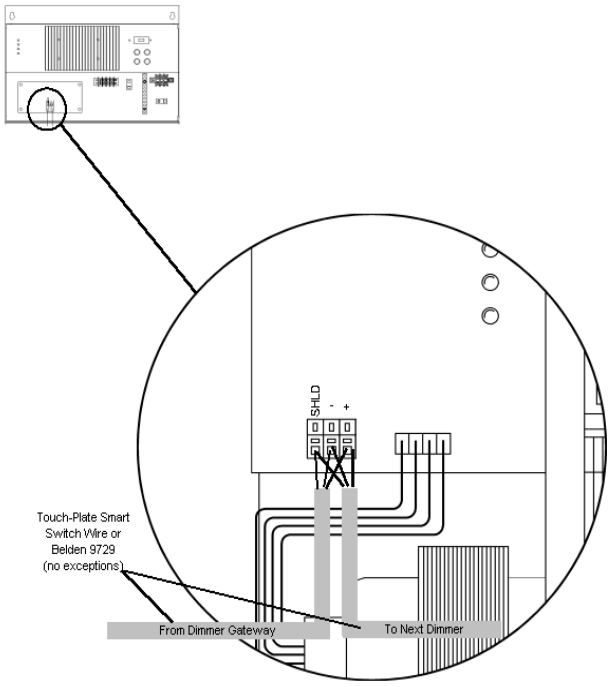


Figure 10 - Detail of Dimmer Network Wiring

The MCP-502B I/O Backplane

If you are using standard, Touch-Plate, low voltage switches or other types of low voltage switching devices, you must add one or more MCP-502B Input/Output backplanes to each of your MCP Panels. The largest MCP panel, the MCP-0048, can accommodate up to 4 MCP-502B backplanes. You may use backplanes in your panels as well as a Smart Switch network if you wish. They do not conflict with each other. (See Figures 15-20 for detailed information on connecting low voltage switches and other types of low voltage switching devices to the MCP-502B.) It is also necessary to make sure that the last backplane in a panel (the one closest to the top of the panel) has **all four** terminating resistors in place. This is **absolutely necessary** because this is the only way the panel knows how many backplanes it contains. (See Figure 15 for locations of the four terminating resistors.)

The MCP-530B Digital Input Card

In addition to the number of backplanes your switch network requires, you will need to add one MCP-530B Digital Input Card for every 8 low voltage switches in the system. Each backplane can accommodate up to 4 digital input cards. Therefore, each backplane can accommodate up to 32 low voltage switches. When using MCP-530B cards, you will need to set the DIP switches on each card for digital addressing. (See Figure 11 for information on setting the addresses on the MCP-530B.)

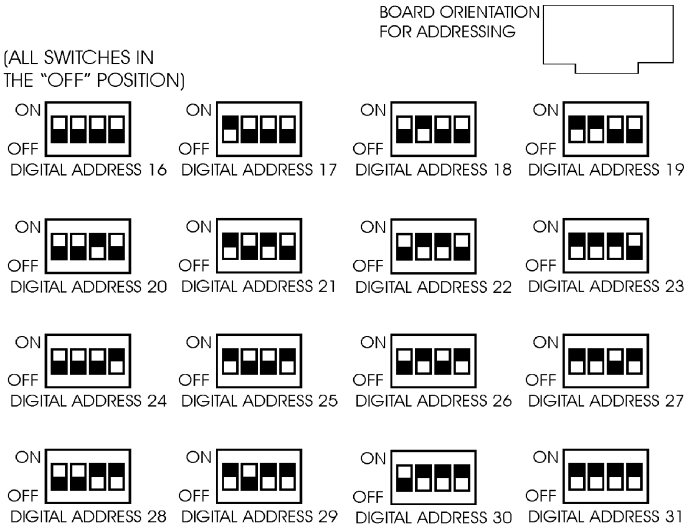


Figure 11 - Digital Address Configuration for the MCP-530B Digital Input Card

The MCP-535A Analog Output Card

When using dimmers **other than Touch-Plate dimmers**, you must use one MCP-535A Analog Output Card for every 8 dimmer channels. The MCP-535A provides analog outputs to dimmers other than Touch-Plate dimmers, so even if you are not using Touch-Plate dimmers, you are not out of luck. The MCP-535A follows the same guidelines as the MCP-530B Digital Input Card in that you can have 4 of them per backplane which provides 32 dimmer channels per backplane. Of course, if you are adding the analog output cards, that cuts down on the space for digital input cards which means that you won't be able to use as many standard, low voltage switches per panel. Touch-Plate dimmers are connected directly to the network via the dimmer gateway and do not need the MCP-535A cards. In addition, you will also need to set the DIP switches on each MCP-535A card for addressing. (See Figure 12 for information on setting the addresses on the MCP-535A)

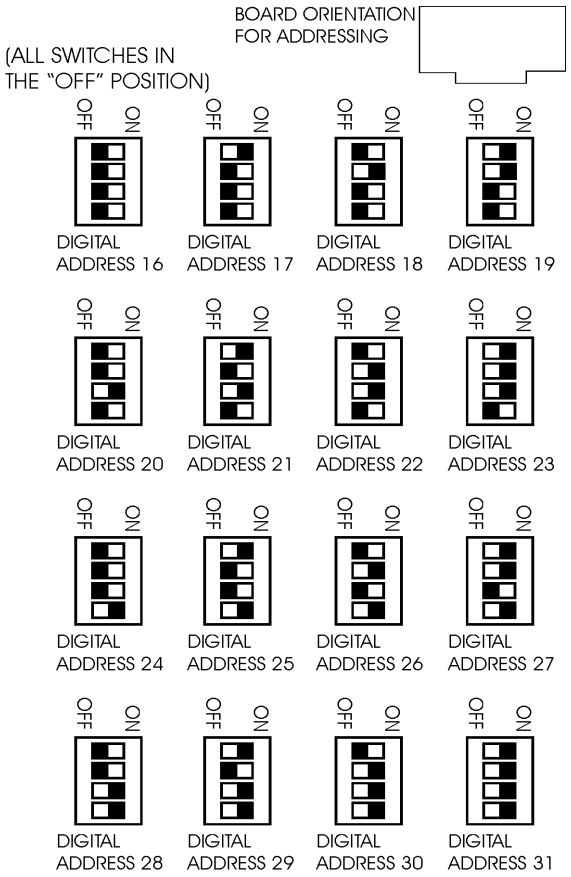


Figure 12 - Digital Address Configuration for the MCP-535A Analog Output Card

MCD Dimmer Addressing

The illustration at the top of this page covers the setup of addressing on the MCD dimmer. The addressing is controlled with a five position DIP switch located in the middle of the dimmer. The first DIP switch is null and not used. The next four switches set the address for the dimmer. The most significant bit is second from the left and the least significant bit is second from the right. The address range is 16 to 31. This address shows up in the MCP operator software as an analog output. Each address handles 8 dimmer channels. Each dimmer module has four channels; therefore, each address handles two dimmer modules to conserve address space. Each address is arranged into an upper and lower "nibble" where each "nibble" handles one dimmer module. The last DIP switch selects which "nibble" the dimmer is on. (Figure 13 shows each of the 32 possible combinations for the DIP Switch.)

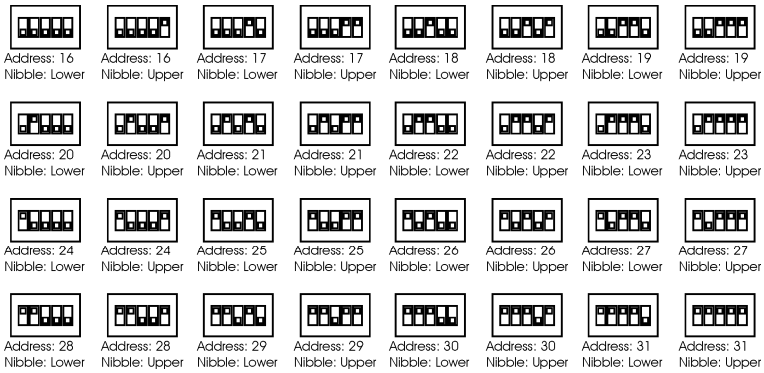


Figure 13 - Detail of Addressing Configuration for MCD Dimmers

MCP-520B Relay Firing Card

The MCP-520B Relay Firing Card is what actually trips the relays in the panel. There is one firing card for every eight relays. There are pushbutton switches on-board that allow the user to trip the relays. The LED's next to them will also turn on when the relay is switched on. The LED is an indicator of whether the relay is on or off. There are 8 switches and LED's per card, one set for each relay. Their positions are relative to the relay positions with the top switch and LED corresponding to the top relay. There are also jumpers on each firing card. The jumpers are located in the top, right corner of the card when the LED's are on the left side of the card. On the last firing card in the in the panel (the card closest to the top of the panel), the jumpers must be positioned on the two pins furthest to the right. (See Figure 14 for an illustration of a relay firing card.)

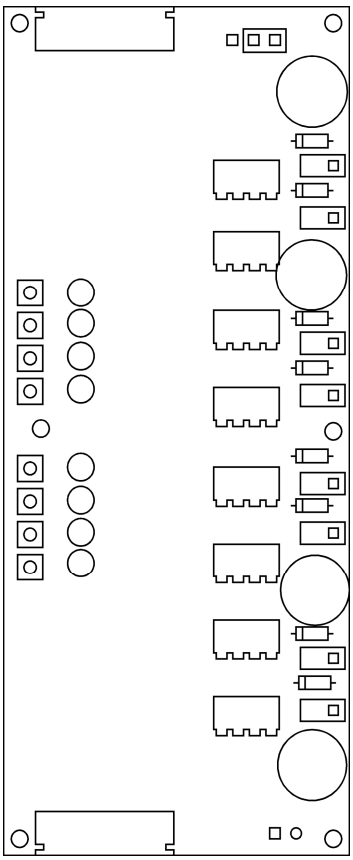


Figure 14 - Illustration of the MCP-520B Relay Firing Card

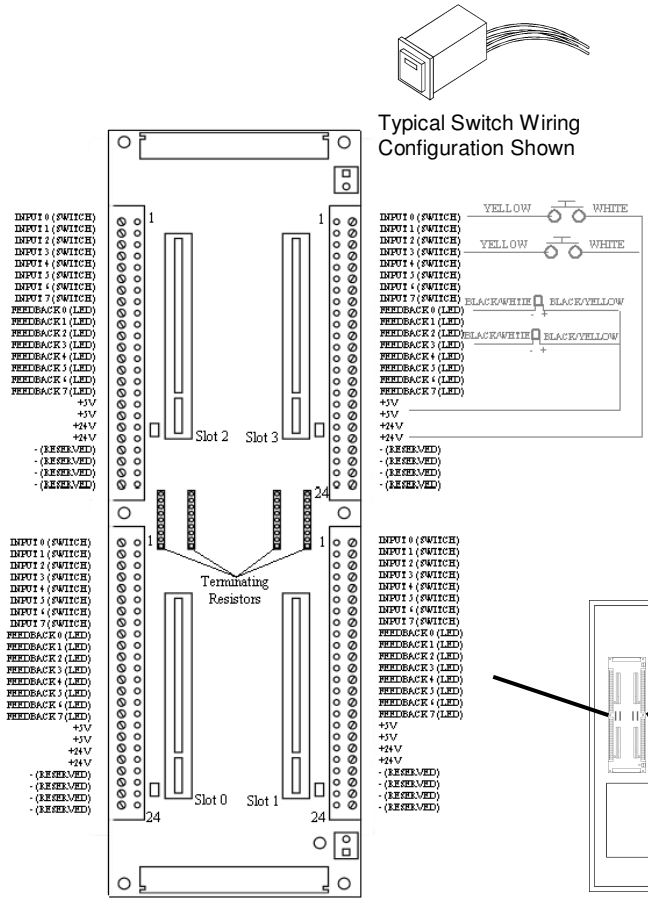


Figure 15 - Illustration of digital Inputs on the MCP Backplane

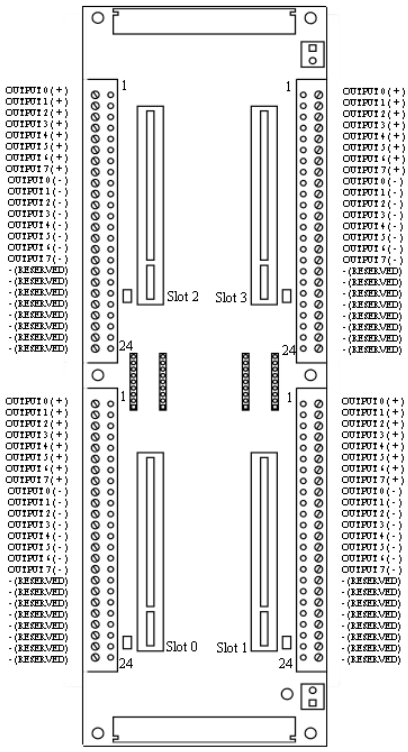
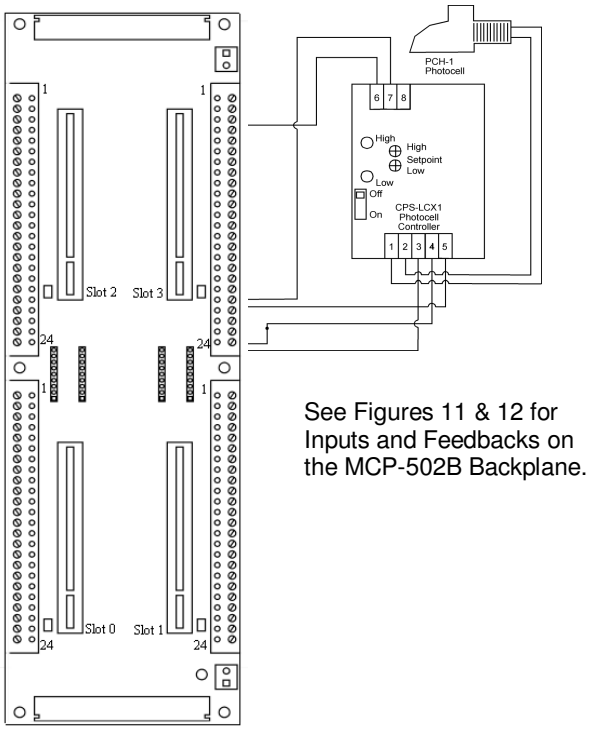


Figure 16 - Illustration of Analog Outputs on the MCP Backplane

Figure 15 illustrates the MCP-502B backplane with the input and feedback structure when using the MCP-530B Digital Input Card. The labels shown are not associated with the backplane itself, but with the structure called for by the digital input card. If you were to use 1, 2 or 3 MCP-530B cards and 1 MCP-535A Analog Output Card, then the set of terminals at the location of the MCP-535A would operate differently. The MCP-535A connections would be outputs instead of inputs and they would only be used for connecting dimmers other than Touch-Plate® brand.

Figure 16 illustrates the MCP-502B backplane and the structure associated with the MCP-535A Analog Output Cards. There may be up to 4 MCP-535A analog cards on one backplane. That means that you can use any combination of the two types of cards as needed, but no more than 4 cards total per backplane. If more slots are needed, you may add another backplane. Depending on the MCP panel you have, you may have space available for 1 to 4 backplanes. The function of the terminals on the backplane depends entirely on the type of card that is inserted there.

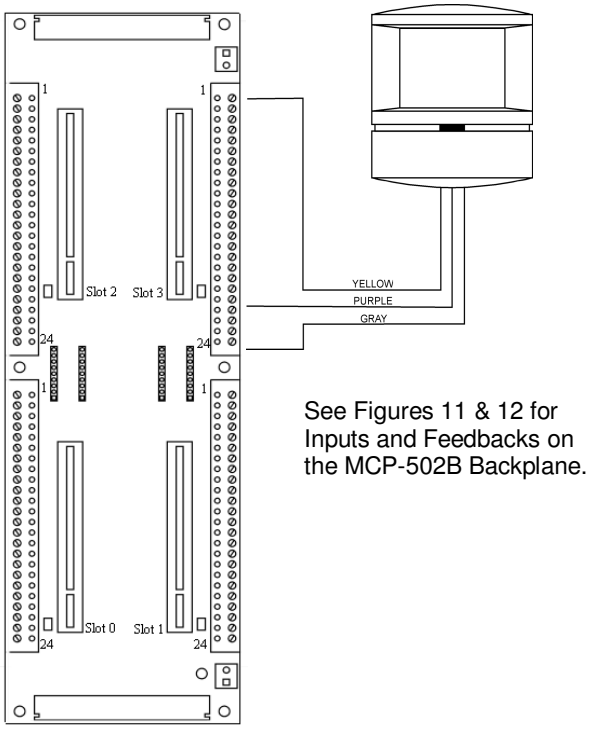


See Figures 11 & 12 for Inputs and Feedbacks on the MCP-502B Backplane.

Figure 17 - Connecting a CPS-PCH1/LCX1 Photocell and Controller to a MCP Panel

The Photocell and Controller

With MCP, you can connect many types of low voltage switching devices. This includes items from the Touch-Plate Control Plus Series (CPS) line of products. Figure 17 shows a CPS-PCH1-LCX1 Photocell and Controller connected to an MCP-502B backplane. These two items allow you to control lighting levels based on the amount of natural light that is visible to the photocell. When the desired amount of natural light diminishes, the photocell senses it and turns the lights on to a preset level. This greatly reduces energy costs, because you are then able to "harvest" daylight while keeping unnecessary lights off. The diagram shows input 3 being used, but any input from 0 - 7 may be used for any switching device. However, you cannot connect two devices to the same input unless they are controlling the same circuit. The +24V is for the switch common and the - (RESERVED) input is serving as ground.



See Figures 11 & 12 for Inputs and Feedbacks on the MCP-502B Backplane.

Figure 18 - Connecting an Occupancy Sensor to an MCP Panel

Occupancy Sensors

It is also possible to connect occupancy detectors to the MCP system. Occupancy detectors allow you to control lights based on infrared, ultrasonic, or dual-technology input from movement in a room. Figure 18 shows a generic occupancy detector. By placing one in a room and connecting it to an MCP-502B backplane, it enables the system to switch lights on when someone enters the room and off again when they leave. Again, this is a great energy saver, because you never have to worry about someone forgetting to turn lights off when they leave a room and there are no unused lights eating up energy. Any hard wired, low voltage occupancy sensor can be used to operate lights just as a normal, maintain switch would function. Again, input 0 is being used, but any input from 0 - 7 may be used. The +24V is for the switch common and the - (RESERVED) terminal is serving as ground. Must use the (-) input as shown for ground, no others. *Other configurations available, contact factory for more information.*

The CPX-RC4 Wireless Receiver

The CPX-RC4 Wireless Receiver shown in Figure 20 is used to control lights via input from a hand held controller. The RC4 is placed in the lighting control system and connected to the MCP-502B backplane. By pressing buttons on a hand-held remote transmitter, the user can control lights on the four circuits controlled by the RC4. The inputs may be programmed as any momentary type including "Dim" signals. **Do not install the CPX-RC4 inside an MCP Panel as this will interfere with the wireless signal and the receiver will not work.**

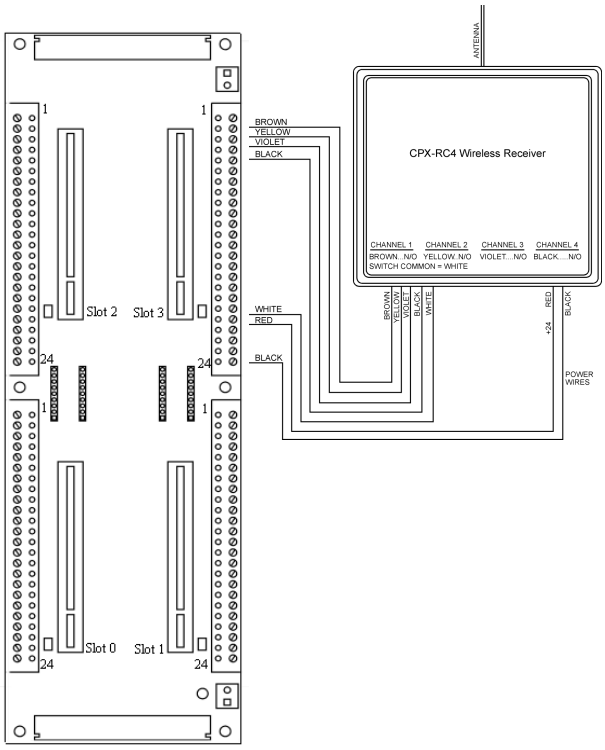


Figure 19 - Connecting a Wireless Receiver to an MCP Panel

Definitions of Terms

Analog - A variable signal ranging from 0 to10 volts.

Cycle - Toggles the current state of an output.
- If an output is ON, then is cycled OFF.
- If an output is OFF, then it is cycled ON.

WARNING: It is not advised to cycle a group.

Digital - A signal that can be represented by two logical states (On / Off).

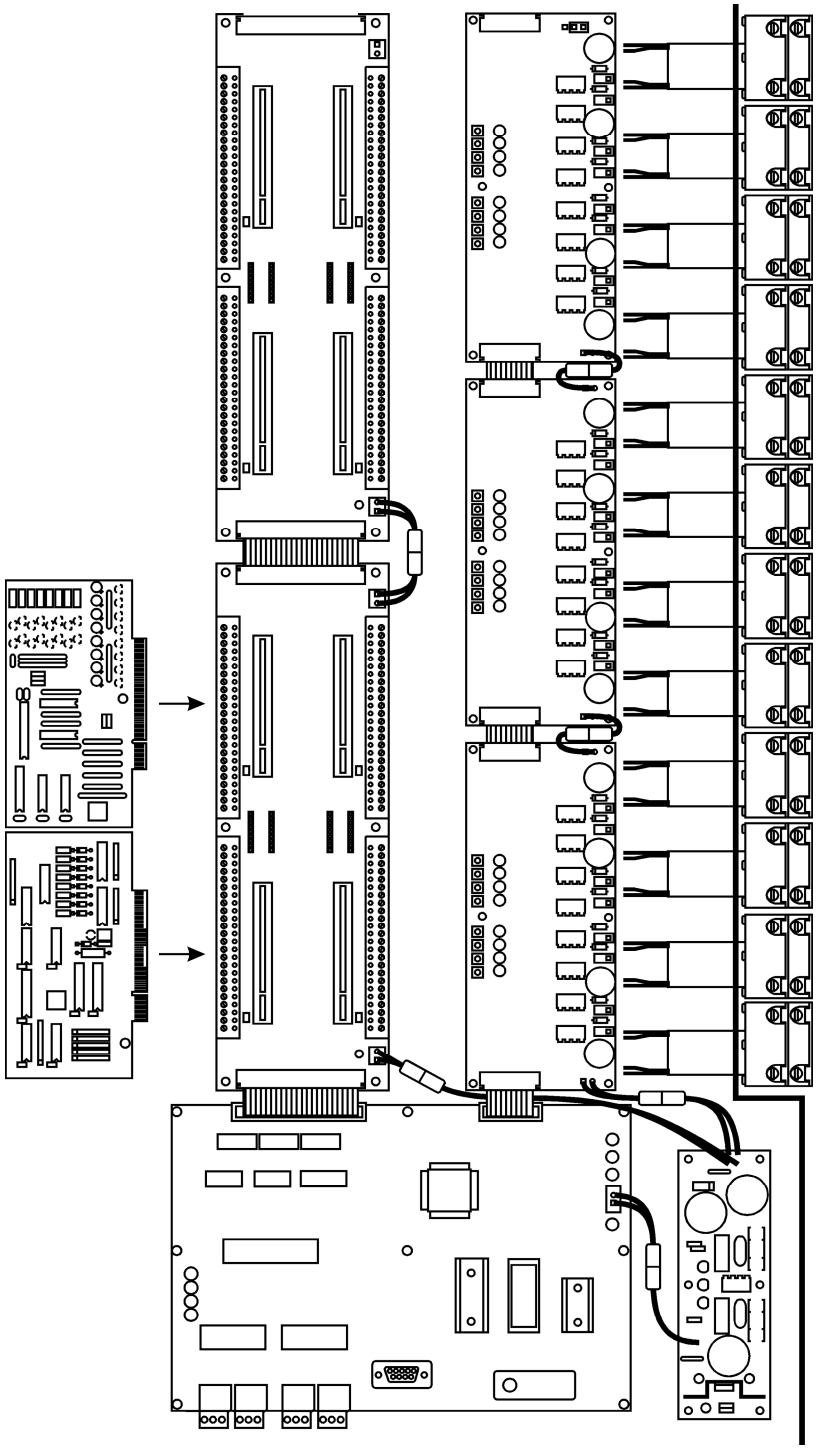
Dimmer - An electronic device that controls incandescent loads from 0 to 100%.

Feedback - Confirmation signal from the output indicating ON or OFF, typically indicated by an LED.

Input - The physical connection of a switch to the I/O backplane. When this input is present, a predefined signal is generated to trigger an output, group, sequence, or event.

Output - The physical control signal of a relay or dimmer to the load.

Touch-Plate® Lighting Controls



Touch-Plate® Lighting Controls

1830 Wayne Trace
Fort Wayne, IN 46803

Phone: 219-424-4323
Fax: 219-420-3651

Sales Support Email: sales@touchplate.com
World Wide Web: http://www.touchplate.com