

PWX-D20

DELAYED POWER EXPANDER

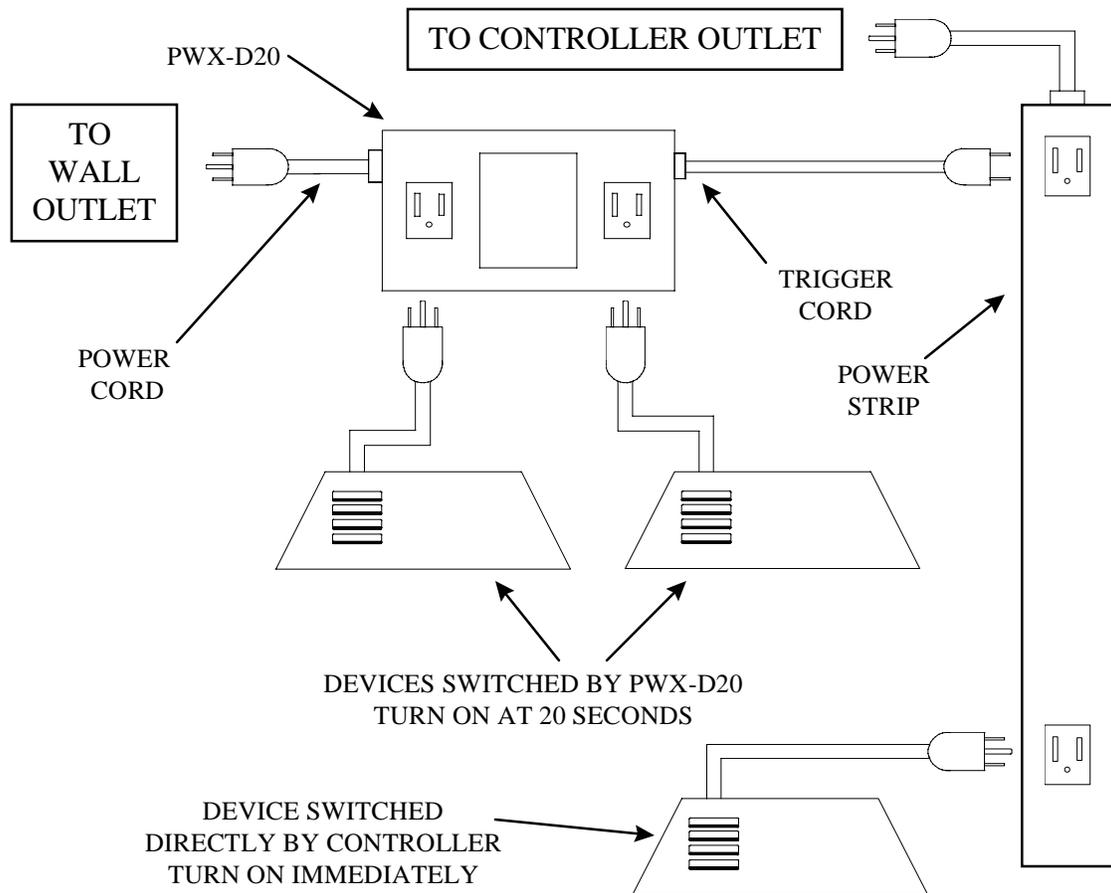
The Solatel PWX-D20 Delayed Power Expander lets you control more devices without tripping circuit breakers. A typical plug-in controller, such as Solatel's Plant Pro, is limited in the current that can be drawn from it because of the 15 Amp rating of the typical 120 VAC outlet. This allows control of only a single 1000 Watt lamp. Adding a PWX-D20 allows control of an additional 1000 W lamp or two 600 W lamps or any other combination of devices that draw no more than 15 Amps total.

The PWX-D20 is similar to the original PWX-1 except it delays 20 seconds before turning on. This allows time for a device's start-up current surge ("inrush") to finish before the next device is turned on and has its inrush current. This is most useful for devices with high inrush currents, such as lamps, air conditioners, dehumidifiers, and heaters. Such devices may have an inrush current many times their normal operating current. If many devices are turned on at the same time, even though plugged into outlets controlled by different circuit breakers, their inrush currents add together at the main breaker. This can cause tripping of the main breaker. Also, the voltage to the whole building will drop briefly which can cause a short dimming of room lights in other parts of the building or even the malfunction of some equipment. This can be especially annoying in apartment buildings where neighbors wonder why their lights dim at the same time every day. Multiple PWX-D20's can be used to control a large number of devices, each delayed 20 seconds from the previous. They can also be intermixed with Solatel's PWX-1 Power Expander (no delay) to provide the same delay for larger groups of devices. The 20 second delay is nominal and can range from 15 to 25 seconds. There is no delay at turn off.

The PWX-D20 has two cords and two outlets. The Power Cord provides current to both of the PWX-D20 Outlets. The Power Cord is usually plugged into a wall outlet that is not on the same circuit breaker as the controller. The Trigger Cord provides the control signal which switches the Outlets on (after a 20 second delay) or off (immediate). The Trigger Cord draws little current and can therefore be connected to a controller along with other devices being controlled without tripping a circuit breaker. The Outlets are on only when there is 120VAC on both the Power Cord and the Trigger Cord (after the delay). If only one cord has 120VAC, then both Outlets are off.

Extension cords on the Power Cord should be rated for the current needed by the devices plugged into the PWX-D20 Outlets. The total current drawn from the PWX-D20 Outlets combined is 15 Amps maximum. Typically, an extension cord, power strip, or outlet tap will be plugged into the controller's outlet. This allows connection of the Trigger Cord in addition to any devices being controlled that are within the current capacity of the controller. This extension cord or equivalent should be rated for the total current drawn by all devices plugged into it. The Trigger Cord draws 0.04 Amps maximum. If only Trigger Cords are plugged into an extension cord, then a standard 18 AWG (or better) cord will do.

BASIC PWX-D20



BASIC INSTALLATION

- **STEP 1** - Plug Power Strip (or extension cord or outlet tap - not supplied) into the controller's outlet.
- **STEP 2** - Plug devices to be switched directly by the controller into the Power Strip. The total current of these devices must be within the current capacity of the controller.
- **STEP 3** - Plug the Power Cord into a wall outlet.
- **STEP 4** - Plug the devices to be switched by the PWX-D20 into the PWX-D20 Outlets.
- **STEP 5** - Plug the Trigger Cord into the Power Strip

OPERATION

The devices plugged into the PWX-D20 will turn on 20 seconds after the devices plugged into the Power Strip. All devices will turn off at the same time.

USING PWX-D20 IN LARGER SYSTEMS

More than one PWX-D20 can be used to switch a group of devices. Installation is generally the same as for a single PWX-D20. They can also be intermixed with Solatel's PWX-1 Power Expander (no delay) to provide the same delay for larger groups of devices.

- **MULTIPLE PWX-D20** - The first PWX-D20 has its Trigger Cord plugged into the Power Strip. The second PWX-D20 plugs its Trigger Cord into an Outlet on the first PWX-D20, the third into the second, and so on. When the controller's outlet turns on, devices plugged into the Power Strip will turn on, 20 seconds later the first PWX-D20 and devices plugged into it will turn on, 20 seconds after that the second PWX-D20 and devices plugged into it, and so on. The PWX-D20's can be arranged in a long row spaced by the length of the Trigger Cords. It uses up one Outlet on the PWX-D20, although a multi-tap adapter could be used. For systems with 1000W lamps, only one lamp can be run per PWX-D20 anyway. If a PWX-D20's Outlet shuts off (such as if a building circuit breaker trips), all PWX-D20's later in the chain will also shut off.
- **MIXED PWX-D20 and PWX-1** - The basic configuration is the same as for Multiple PWX-D20 as described above. However, one or more PWX-1's have their trigger cords plugged into the controller's Power Strip and into the PWX-D20's. This approach is useful if the building's electrical system can handle several devices switching at once but not all of them. The mix of PWX-D20's and PWX-1's depends on how many devices can be switched on at once. When the controller's outlet turns on, devices and PWX-1's (and hence their devices) plugged into the Power Strip will turn on. Next, 20 seconds later the first PWX-D20 will turn on along with devices and PWX-1's (and hence their devices) plugged into it. Then, 20 seconds after that, the second PWX-D20 will turn on along with devices and PWX-1's (and hence their devices) plugged into, and so on. If a PWX-D20's Outlet shuts off (such as if a building circuit breaker trips), all PWX-D20's and PWX-1's later in the chain will also shut off. If for a similar reason a PWX-1 shuts off, only those devices plugged into it will shut off.

The building's circuit breakers need to be considered. Even though each PWX-D20 can provide 15 Amps, if two PWX-D20's or PWX-1's Power Cords are both plugged into wall outlets on the same breaker, the total current will be limited to the breaker rating, typically 15 or 20 Amps. In many cases, the Power Cords will need to be plugged into wall outlets on different breakers to avoid this problem. The Power Cords should not all be plugged into the same power strip or extension cord because they would then all be on the same circuit breaker.

MULTIPLE PWX-D20

This example shows a system where only one 1000Watt lamp is turned on at a time. There is a delay between each lamp. There are a total of four lamps. One lamp is switched directly by the controller. Three PWX-D20's switch the other lamps. Instead of 1000W lamps, a larger number of smaller lamps could be switched, within the current limits of the switching devices.

SEE DIAGRAM ON PAGE 5

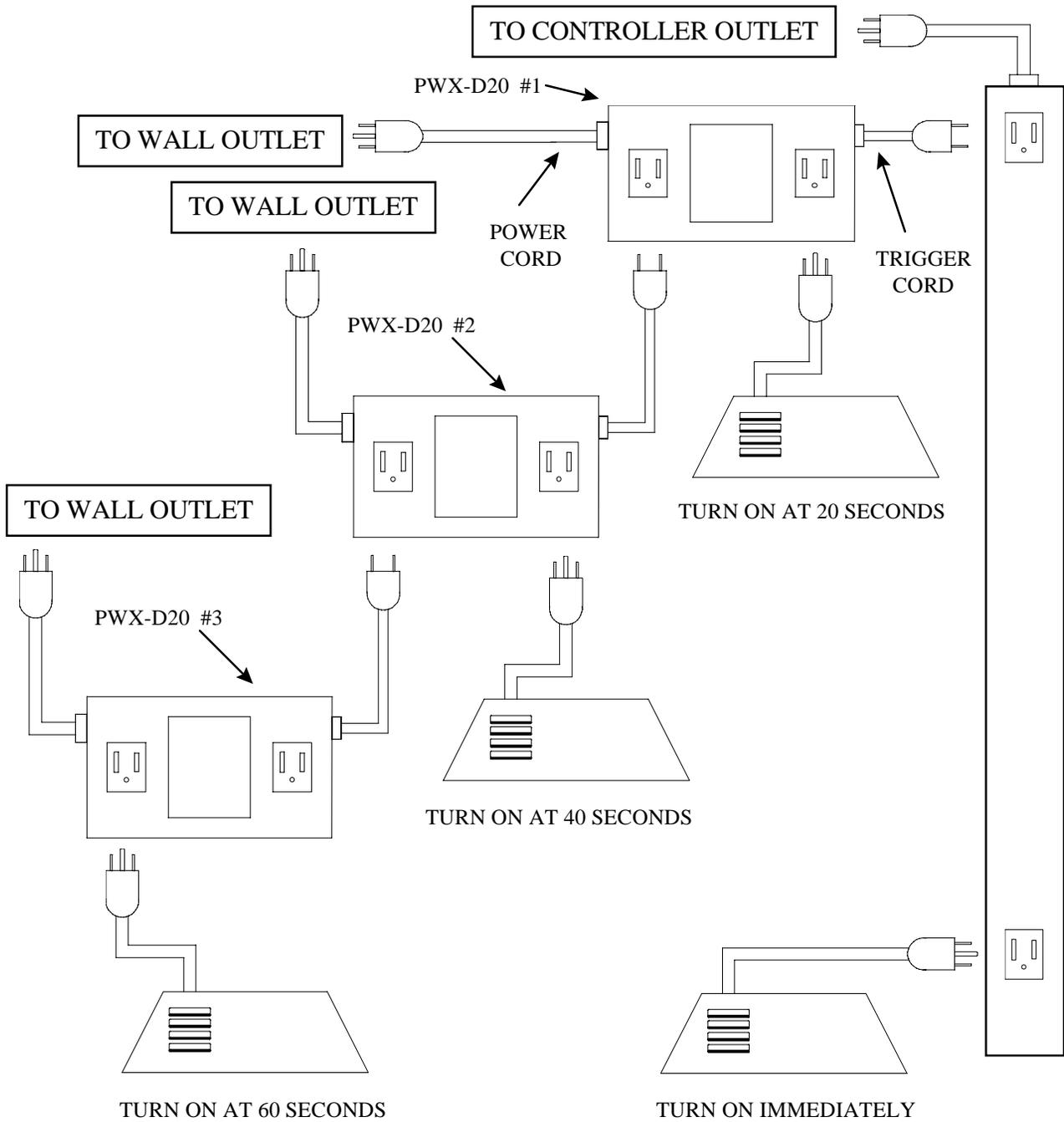
INSTALLATION

- **STEP 1** - Plug Power Strip (not supplied) into the controller's outlet.
- **STEP 2** - Plug devices to be switched directly by the controller into the Power Strip.
- **STEP 3** - Plug the Power Cord of each PWX-D20 into a wall outlet.
- **STEP 4** - Plug devices to be switched by PWX-D20's into PWX-D20 Outlets.
- **STEP 5** - Plug the Trigger Cord of PWX-D20 #1 into the Power Strip.
- **STEP 6** - Plug the Trigger Cord of PWX-D20 #2 into Outlet of PWX-D20 #1.
- **STEP 7** - Plug the Trigger Cord of PWX-D20 #3 into Outlet of PWX-D20 #2.

OPERATION

- **0 SECONDS** - Controller's outlet turns on.
Devices plugged into Power Strip turn on.
- **20 SECONDS** - Devices plugged into PWX-D20 #1 turn on.
- **40 SECONDS** - Devices plugged into PWX-D20 #2 turn on.
- **60 SECONDS** - Devices plugged into PWX-D20 #3 turn on.

MULTIPLE PWX-D20



MIXED PWX-D20 AND PWX-1

This example shows a system where two 1000W lamps are turned on at a time. There is a delay between each pair of lamps. There are three pairs of lamps for a total of six lamps. One lamp is switched directly by the controller. Two PWX-D20's and three PWX-1's switch the other lamps. Instead of 1000W lamps, a larger number of smaller lamps could be switched, within the current limits of the switching devices.

SEE DIAGRAM ON PAGE 7

INSTALLATION

- **STEP 1** - Plug Power Strip #A (not supplied) into the controller's outlet.
- **STEP 2** - Plug devices to be switched directly by the controller into Power Strip #A.
- **STEP 3** - Plug the Power Cord of each PWX-1 and PWX-D20 into a wall outlet.
- **STEP 4** - Plug devices to be switched by PWX-1's and PWX-D20's into their Outlets.
- **STEP 5** - Plug the Trigger Cord of PWX-1 #A into Power Strip #A.
- **STEP 6** - Plug the Trigger Cord of PWX-D20 #1 into Power Strip #A.
- **STEP 7** - Plug Power Strip #B (not supplied) into the into Outlet of PWX-D20 #1.
- **STEP 8** - Plug the Trigger Cord of PWX-1 #B into Power Strip #B.
- **STEP 9** - Plug the Trigger Cord of PWX-D20 #2 into Power Strip #B.
- **STEP 10** - Plug the Trigger Cord of PWX-1 #C into Outlet of PWX-D20 #2.

OPERATION

- **0 SECONDS** - Controller's outlet turns on.
Devices plugged into Power Strip #A turn on.
Devices plugged into PWX-1 #A turn on.
- **20 SECONDS** - Devices plugged into PWX-D20 #1 turn on.
Devices plugged into PWX-1 #B turn on.
- **40 SECONDS** - Devices plugged into PWX-D20 #2 turn on.
Devices plugged into PWX-1 #C turn on.

MIXED PWX-D20 AND PWX-1

