

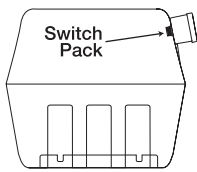
PSP-101/102 Fiber Optic Switch Pack Installation Notes

CAUTION

- Read and understand these instructions prior to starting installation.
- **TURN THE POWER OFF** before installation. Live installation is hazardous to you and can damage the motion sensor.
- Capacitor charge storage in a de-powered light fixture can be lethal. Only qualified personnel familiar with high voltage should install this motion sensor.
- This product must be installed in accordance with applicable electrical codes and regulations pertinent to the city of installation.



Mounting switch pack to fixture: The PSP switch pack is intended to be mounted directly on the ballast.



Fixture Compatibility: PSP-101/102 is compatible only with HID fixtures shipped with a dual-section capacitor or field-retrofitted with one. This capacitor must be sized (voltage and capacitance) in accordance with recommendations of the fixture or ballast manufacturer. Consult schematic on ballast transformer.

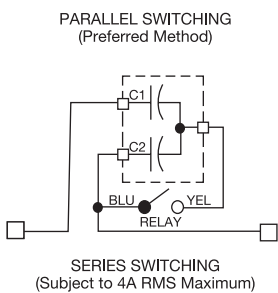
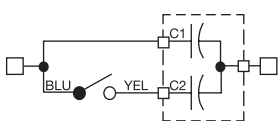
Why is the fixture's dim step nearly full brightness? When the capacitor is properly sized the dim step is 50% of the full-brightness power level. However, the human eye's logarithmic response sees this as only a modest reduction in lamp brightness. Deeper dimming is possible with alternate cap values but this operation is not recommended due to shortened lamp life.

Where can I purchase dual-section capacitors? From the fixture's manufacturer or Parallax Power Capacitor (formerly MagneTek Capacitors) www.parallaxpowercap.com

Viewpoint Electronics does not sell HID capacitors and they are generally not stocked by local electrical distributors.

Can I use two single-section caps instead of one dual-section cap? Yes, but determine whether the ballast housing has sufficient room and hold-down clamps for two caps.

Parallel vs. series cap switching methods.



The choice of microfarads and voltage rating for the dual cap is based on whether it is used in the series or parallel configuration. Cap values, voltages, and physical sizes are different for each method even though they yield the same lamp dimming. Your cap vendor may stock both cap styles for a given fixture type.

The PSP switch pack will work with either method (4 amps maximum relay switching current) but parallel connection is preferred. Parallel connection results in lower switching currents and (usually) physically smaller capacitors. Determine whether your choice of cap fits in the ballast housing!

The series switching method shorts one of the two capacitor sections with a relay closure in the sensor, resulting in maximum microfarads and full brightness mode. The parallel switching method parallels two capacitor sections via a relay closure in the sensor, resulting in maximum microfarads and full brightness mode.

What are the indications that my dual-section cap is sized incorrectly? The lamp may extinguish when the dimmed step is selected. Damage to the ballast transformer, capacitor, and/or motion sensor may result from wrong capacitor choice. The lamp life may be shortened. Poor power factor may result in little or no energy savings despite dimmed lamp operation.

TEST SWITCH HERE dot. The motion sensor contains a manual override switch that is activated by placing a strong permanent magnet near the red TEST SWITCH HERE dot on the enclosure. A pocket magnet is usually sufficiently strong but a flexible refrigerator magnet is not. The override magnet causes the relay to change state with an audible "click". Using the override magnet zeroes-out whatever time remains in the lamp warm up and TIME timer intervals.



FIBER OPTIC NETWORKING NOTES

What unique features are offered by the fiber optic members of this family? The PIP-201/202 motion sensors are equipped with connectors that accept industry-standard jacketed optical fiber with 1.0 mm core. (The PIP-001 motion sensor does not feature fiber optic networking.) The PIP-201/202 motion sensors can "talk" to adjacent light fixtures equipped with PIP-101/102 Switch Packs. The optical fiber facilitates zone control within aisles.

The PSP switch packs have no PIR motion sensing capability. They receive their command to send the fixture to high brightness step from the inbound optical fiber. The PSP switch packs are equipped with short pigtail wire leads for mounting directly to the ballast housing.

Why is plastic optical fiber better than low-voltage copper wiring used in control systems offered by other manufacturers?

Fiber can be used in retrofit jobsites without conduit. The optical fiber can be secured to the outside of conduit using ordinary wire ties. Optical fiber is non-conductive and provides a safe method for interconnecting high voltage fixtures wired to different AC phases

Why are PSP's fiber connectors color coded? The black connector receives signals from upstream devices. The blue connector transmits signals to downstream devices. Simply stated, blue connectors "talk" to black connectors.

Two blue connectors or two black connectors should never be fibered to each other.

What is the white dummy plug inserted in the black fiber connector? As shipped from the factory, the black connector is plugged with a removable white plastic pin to facilitate testing. Without a fiber or pin inserted in the black connector, the PSP device may give erratic behavior due to stray light.

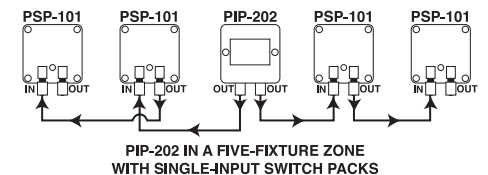
Is there a limitation on the maximum number of PSP fiber devices in each aisle? No. Each fiber optic zone must have at least one motion sensor. A zone may include any number of switch

packs—even zero. The signal emitted by a blue connector is regenerated at full intensity and clarity compared to the attenuated signal arriving on the black connector, hence there is no maximum aisle length.

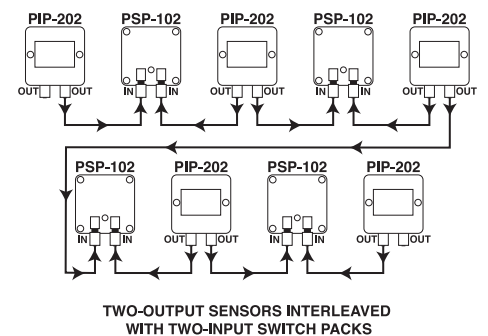
However, the spacing between devices is limited to 200 feet—possibly less if you are a sloppy fiber terminator. (See comments below about clean fiber termination.)

Why does the PSP-102 switch pack have two black connectors but no blue one?

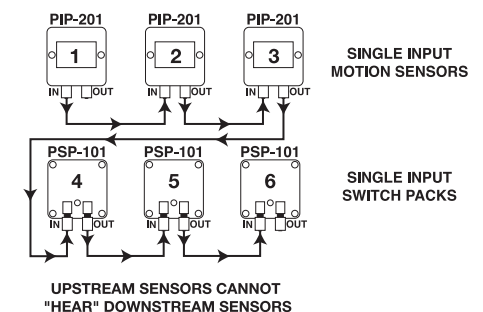
The PSP-101 is intended for creating motion sensor-centric aisle zones that look like this:



Or PSP-102 dual-input switch packs can be interleaved with motion sensors:



Can I "fiber" the sensors and switch packs in any order in the aisle? No, at least not with the analog versions of the PIP devices introduced in early 2003. (Second-generation products to be introduced in late 2003 are digital and can be fibered in any order.) This limitation of the first-generation analog products results from the fiber connectors' uni-directional data transmission characteristics. Upstream PIP devices cannot "hear" signals from downstream devices:



In the example network shown above, upstream motion sensor #1 cannot go "high" as a result of motion under sensors #2 or #3. However, downstream devices #3 through #6 will go high if motion occurs under sensors #1 or #2.

PSP-101/102 Fiber Optic Switch Pack Installation Notes

SPECIFICATIONS

Fixture Compatibility	HID with constant wattage autotransformer ballast
Step Dimming Method	Relay-switched dual-section capacitor
Switching Configurations	Parallel (preferred) or series capacitors
Relay Current Rating	4 amperes RMS maximum
Maximum Fixture Wattage	1000 watts parallel mode/400 watts series mode
AC Line Voltage (white and black wires)	208/240/277/480VAC
Switch Pack Power Consumption	3 watts maximum
Ambient Temperature Range	0-50° C non-condensing
Lamp Warm-up Interval	15 minutes (not adjustable)
Installation Assists	Magnetic Test Switch and Blinking LED
Mounting Options	1/2" NPT nipple
Maximum Fiber Spacing Between Nodes	200 feet
Wire Harness	4 Conductor 18AWG stranded copper
Wire Harness Length	9 inches
Dimensions (including mounting nipple)	3.25" x 3.25" x 3.25"
UL File Number	Category FNFT File No. E234927

What happens if I create a fiber loop connecting the last device in the aisle to the first one? First-generation PIP-201/202 motion sensors and PSP-101/102 switch packs cannot be fibered in this way. They lock up and remain on the high brightness step. Second generation digital devices introduced in late 2003 encourage the use of fiber loops.

Do PIP devices have diagnostic features to assist debugging the fiber network? Yes. Your eye and an ordinary flashlight make excellent fiber testers. The light emitted by the blue fiber connector is ordinary 638 nm red light. Even tens of meters away from the blue transmit connector, red light exiting a plastic fiber is visible to the naked eye.

The "polarity" of the fiber signal is:

Red fiber light ON:
downstream PIPs/PSPs go to high brightness

Red fiber light OFF:
downstream PIPs/PSPs go to dimmed step

The black receiving connector of a PSP device has a broad spectral response. It treats the white light from a flashlight the same as red light from the blue transmit connector.

Shining a flashlight into an open fiber segment will cause downstream PSP devices to go to the high-brightness step. Covering the open fiber segment with your thumb (assuring that no stray light gets into the fiber) forces downstream PSP devices to the dimmed step.

Blinking Red Diagnostic Lamp. The PSP switch Pack offers a diagnostic lamp that "blinks" three distinctive patterns:

1 st Blink	2 nd Blink	Fiber State	Fixture State
Short	Short	Dark	Low Brightness
Short	Long	Dark	High Brightness
Long	Long	Lighted	High Brightness

The lamp warm-up interval overrides the fiber signal immediately after power ON but surrenders control to the fiber after fifteen minutes of operation.

OBTAINING PLASTIC OPTICAL FIBER

Where can I purchase plastic optical fiber? What are its characteristics? The plastic optical fiber is manufactured by Mitsubishi Rayon under the trade names SUPER ESKA and PREMIER ESKA:

www.pofeska.com/pofeskae/pofe/pofe.htm

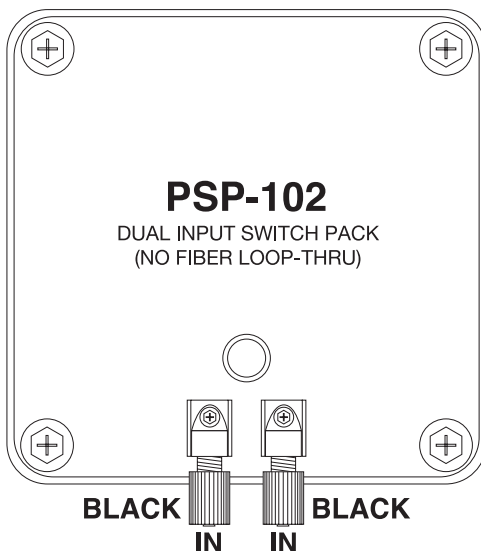
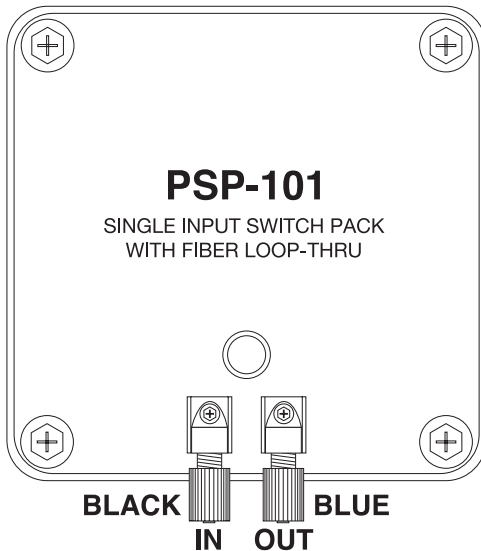
As of early 2003, the cheapest version of ESKA suitable for PIP applications is Mitsubishi part number SH4001 with an attenuation of 0.2 db per meter. It comes on 500 and 1000 meter reels.

Mitsubishi's most visible distributor is:

Industrial Fiber Optics, Inc.
627 South 48th Street Suite 100
Tempe, AZ 85281
(480) 804-1227

www.i-fiberoptics.com

Industrial Fiber Optics sells low-cost hand tools that provide a clean cleave of plastic fiber without special training. IFO's polishing pucks are handheld, fine grit abrasive disks that allow you to clean up carefully chopped fibers to give low attenuation.



PSP devices employ the jacketed version of Mitsubishi fiber with a core diameter of 1.0mm (1000 um). Mitsubishi data sheets refer to jacketed fiber as optical cable in contrast to bare clear fiber which has no protective jacket. Do not purchase bare fiber: PSP devices require "simplex" single-strand jacketed fiber.

The lowest-cost optical cable has a black polyethylene jacket. The polyvinyl chloride jacketed GHV4001 is more expensive but feature Underwriters Labs VW-1 flame rating for plenum-rated installations.

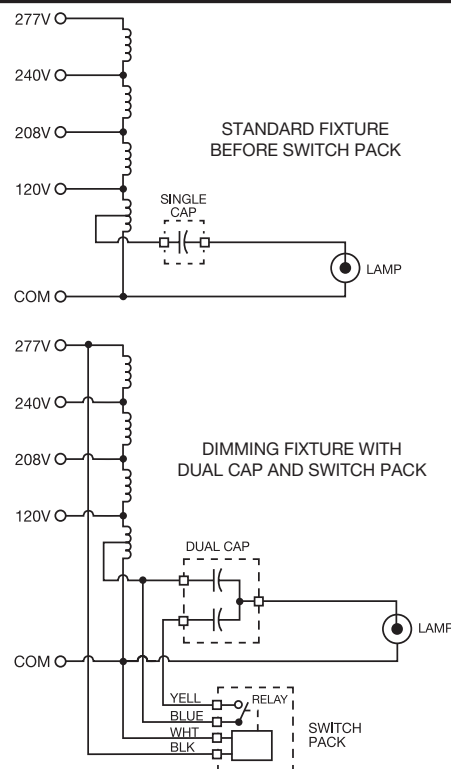
The essential differences between Super ESKA and Premier ESKA fiber relate to data rate and attenuation. The data rate for PIP devices is slow and typical signal levels are high. If your tools and skills permit you to make fiber cuts with clean cleaves, feel free to purchase the least expensive versions of optical fiber.

Can plastic optical fiber be spliced? Yes. There are splicing connectors and tools on IFO's website.

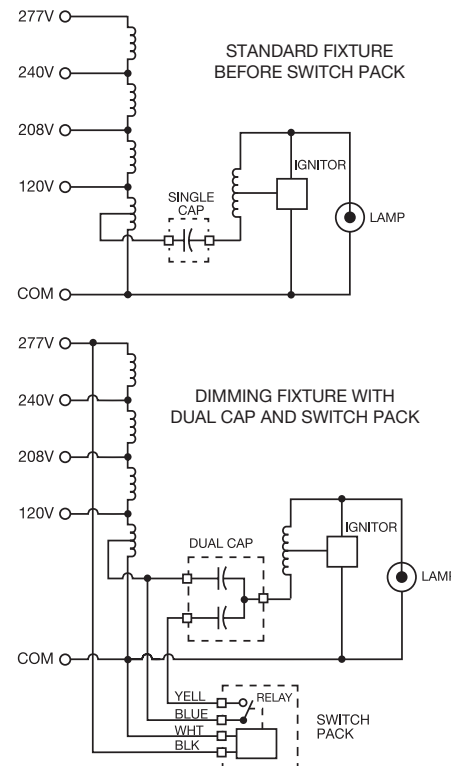
Wiring Schematic to Ballast



High Pressure Sodium or Pulse Start Halide



Metal Halide Fixture Without Pulse Start



VIEWPOINT
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