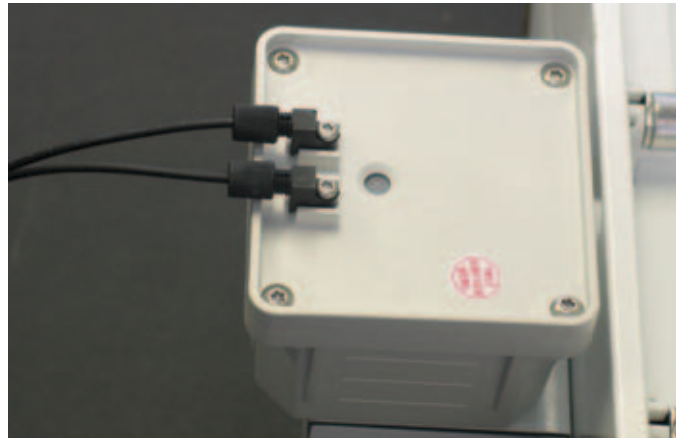


PSP-301 Fluorescent Switch Pack Installation Notes

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.
- This sensor does not switch both sides of AC line voltage. 480VAC fixtures with unpowered lamps may have hazardous voltage present on the primary side of its fluorescent ballasts.
- This product must be installed in accordance with applicable electrical codes and regulations pertinent to the city of installation.
- Do not use this switch pack with fluorescent loads that individually or collectively exceed 400 watts or 5 amps RMS at full power.



Wide Fixture Versatility. PSP-301 switch packs are designed for use with multiple ballast fluorescent fixtures equipped with programmed rapid start electronic ballasts. The switch pack is optimized for fixtures containing four or six fluorescent lamps but can be used with other lamp configurations.

The PSP-301 is similar in design to the companion fiber-equipped PIP-311 motion sensor. The switch pack has no motion-sensing capability and need not be mounted in a down-looking position on the fixture.

The fiber optic networking used with PSP-301 and PIP-311 products is digital and offers advanced features not available with Viewpoint's earlier analog fiber optic products. Earlier analog versions required sensors to be fibered "upstream" from switch packs. Upstream devices could not respond to motion under "downstream" sensors.

The digitally-communicating PSP-301 is essentially a two-way device that allows arbitrary sequencing of motion sensors and switch packs within an aisle.

Ballast Compatibility. Don't use PSP-301 switch packs with instant start fluorescent ballasts. Shortened lamp life will result.

The PSP-301 is not compatible with electronic ballasts that offer low-voltage continuous dimming pins. The high-current relays used in the sensor will not reliably switch low-voltage/low-current DC signals typical of continuous-dimming pins.

The PSP-301 switch pack does not "dim" the fixture. It reduces the light output of the fixture by selectively de-powering the primary side of ballasts in response to aisle occupancy.

Three Independent Relay Contacts. The PSP-301 contains three independent relays tied to a single common wire. Each relay drives one ballast in the fixture. If the attached fixture contains only two ballasts, one relay in the sensor will remain unused.

If your fluorescent fixtures contain only one ballast, one of PSP-301's primary benefits (ballast rotation) will not be accessible to you. If your fixtures contain only one ballast, contact Viewpoint for information on lower-cost, single-relay fluorescent switch packs.

Ballast Rotation; Night-lighting. A night-lighted fixture is one that remains partially ON with a single powered ballast when the aisle is empty. The goal of night-lighting is to provide a minimum level of light in an empty aisle.

In older jobsites the night-lighted ballast traditionally bypassed the motion sensor and was fed continuously from AC mains. Night-lighted lamps reached end-of-life sooner than sensor-controlled lamps. This maintenance problem is magnified in low-activity aisles because re-lamping intervals are dictated by the continuously-powered night-light lamps.

With PSP-301 switch packs, all of the ballasts in a night-lighted fixture is under switch pack control. The switch pack, based on a set-up parameter in its configuration memory, leaves one ballast powered when the aisle is empty. Each time the aisle goes dormant the switch pack rotates the choice of night-lighted ballast to equalize the operating hours of the lamps.

For those fixtures which are not night-lighted (i.e. they go fully dark when there is no activity in the aisle) PSP-301's multi-relay architecture provides no lamp life

extension over single relay sensors.

However, a triple-relay switch pack used with every switch-packed fixture—night-lighted or not—reduces spare parts inventory and simplifies provisioning of fixtures at time of installation.

Switch Pack Mounting. Viewpoint offers several metal brackets that permit PIP/PSP products to be mounted directly on the ends of popular linear high-bay fixtures. These brackets include a 6-pin connectorized electrical interface.

Several fixture manufacturers offer plug 'n' go versions of their fixtures that directly accept PIP-310/-311 sensors and PSP-301 switch packs. These fixtures require no drilling or modification and they include internal wire harnesses that are compatible with PSP-301's electrical connector.

Viewpoint will provide customized wire harnesses to you or a fixture vendor of your choosing. These harnesses replace the wiring on the AC line side of the ballasts.

I will create my own mounting method. For users who prefer to devise their own fixture mounting Viewpoint offers a "barebones" PSP-301 with an optional unconnectorized pigtail wire harness. This product is shipped without a mounting bracket.

Although the switch pack need not point downward toward the floor (it has no motion sensing capability) don't mount it below the lamps. Strong UV light emitted by the lamps will discolor the switch pack's enclosure.

When you choose your favorite mounting position on the fixture, keep in mind that the ability to see the blinking LED on the front of the switch pack is an advantage when you're diagnosing networking problems.

I'd like to mount the PSP-301 switch pack remotely from the fixture. Does Viewpoint offer a version with a long STOW cord? Possibly, depending on how many conductors you plan to use. Viewpoint's UL-approved strain relief where the cord enters the switch pack is currently limited to four wires, not five. Four wires would be sufficient if you plan to switch only two ballasts in the attached fixture.

PROGRAMMING CONFIGURATION MEMORY

Non-volatile flash memory in the PSP-301 stores three configuration parameters permanently—even in the absence of AC power. This memory can be configured by Viewpoint to your specific jobsite requirements prior to shipping. Alternatively, installers can program the memory themselves when the switch pack is mated to the fixture

Parameter	Values
Number of 5Ballasts	1, 2 or 3
F/O Node Address	1-31
F/O Parent List	up to 8 entries

The *only* method for programming PSP-301s is to use the VPT-001 Programming Tool. This contrasts with the companion PIP-311 motion sensor which can be partially programmed with a pocket magnet.

The VPT-001 hand tool "talks" to the PSP using the switch pack's fiber optic ports. The programming tool has a digital display and keypad to speed the entry of programmed data.

Configuring the number of ballasts. PSP-301's non-volatile memory must be configured to identify the num-

ber of switched ballasts in the fixture. The available choices are 1, 2 or 3 ballasts.

Choosing 1 makes all three relay contacts close in the

JVO: insert picture here later of VPT-001 programmer tool.

VPT-001 Programming tool

presence of aisle activity and open when the aisle is inactive. You should choose 1 if you have two or three ballasts but do not want the fixture "night-lighted". Choosing 1 causes the attached fixture to go entirely dark when the aisle is empty.

If you select 2, the PIP-310 will never close the relay associated with the brown output wire, regardless of aisle activity. Two-ballast, rotated night-lighting will be implemented between the orange and violet output wires.

If you select 3, the PIP-310 will implement night-lighting and ballast rotation between all three ballasts.

How can I confirm correct programming of the 'number of ballasts' memory? Attach the switch pack to a powered fixture. Bring a pocket magnet near the **TEST SWITCH HERE** dot after power is applied. The switch pack will cycle endlessly between the occupied and unoccupied aisle states. If all ballasts turn on and off simultaneously, the ballast setting is 1. If the setting is 2 or 3 the attached fixture will evidence rotation corresponding to the programmed ballast number.

Blinking Red Diagnostic Lamp. The sensor contains a red LED behind the Fresnel lens that "blinks" three diagnostic patterns during normal switch pack operation:

Pattern	Motion Observed	Fixture State
Single	No	Low Power
Double	No	High Power
Triple	Yes	High Power

Range Adjustment. The RANGE setting is factory preset at half scale and is appropriate for most applications. Sensor range is influenced by the temperature of the floor below the sensor. A warm floor reduces IR contrast and range. A lower RANGE setting is indicated if adjacent aisle motion false-triggers the sensor. Higher RANGE settings give better IR sensitivity but may result in false-triggering from ceiling-mounted HVAC blowers.

FIBER OPTIC NETWORKING NOTES

What features are offered by the fiber optic versions of the PIP-310? Some members of the PIP-910 family of sensors are available with connectors that accept industry-standard jacketed plastic optical fiber with 1.0mm core. The fiber allows the sensors to communicate with each other and with PSP-301/302 fiber optic switch packs to create control zones within aisles.



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PSP-301 Switch Pack Installation Notes Continued

Why is plastic optical fiber better than low-voltage copper wiring used in controls 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 networking high voltage fixtures wired to different AC phases.

Why are PIP's fiber connectors color coded?

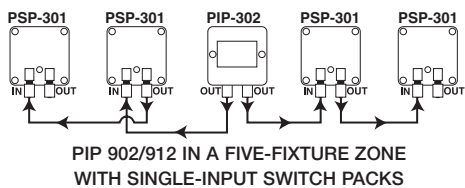
The black connector receives signals from upstream devices. The blue connector transmits signals to downstream devices. Simply stated, blue connectors "talk" to black connectors.

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

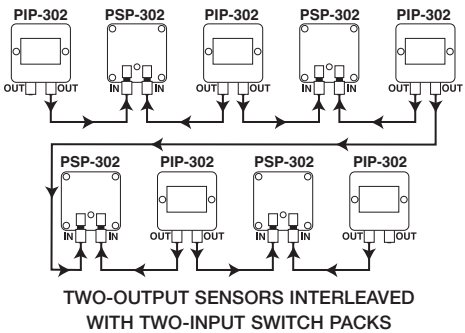
Is there a limitation on the maximum number of PIP fiber devices in each aisle? No. Each fiber optic zone must have at least one motion sensor. A zone may include any number of switch packs—even zero. The signal emitted by a blue connector is regenerated at full intensity and clarity compared to the attenuated signal arriving at the black connector, hence there is no maximum aisle length.

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

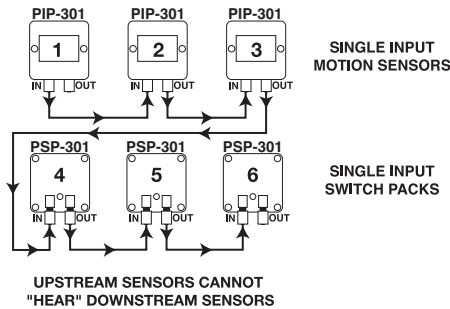
Why does the PIP-312 motion sensor have two blue connectors but no black one? The PIP-912 is intended for creating zones that look like this:



or interleaved with dual-input switch packs like this:



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 mid-2004. (Second-generation products to be introduced in early 2005 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.

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 go to high brightness
- Red fiber light OFF: downstream PIPs go to dimmed step

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

Shining a flashlight into an open fiber segment will cause downstream PIP 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 PIP devices to the dimmed step.

What is the 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 PIP device may give erratic behavior due to stray light.

Lamp Protective Timer Mode: The lamp protective time interval is the exception to the above. For 15 minutes after the HID fixture is first powered, a PIP 911/912 will ignore all signals on the fiber and remain in the high brightness step.

If you swipe the manual override sensor with a pocket magnet, the PIP 911/912 will exit the lamp protective timer mode and resume responding to signals on the fiber.

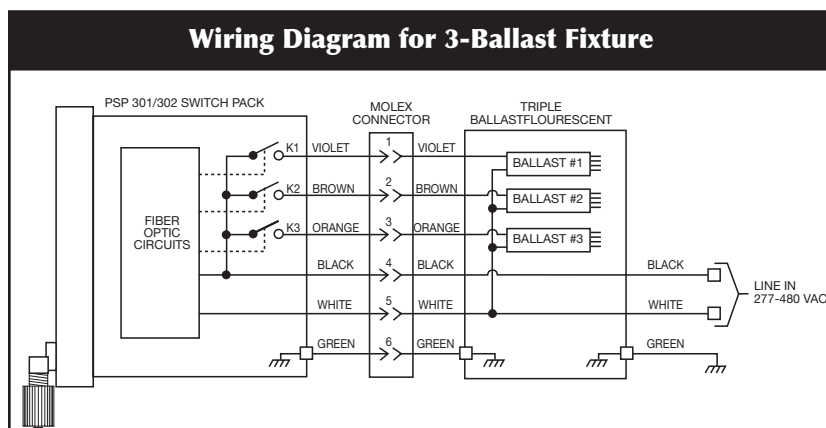
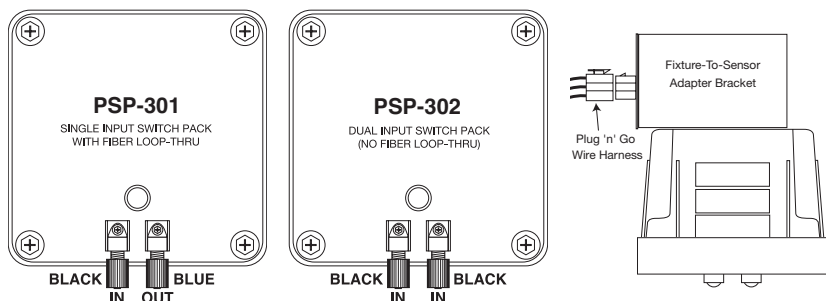
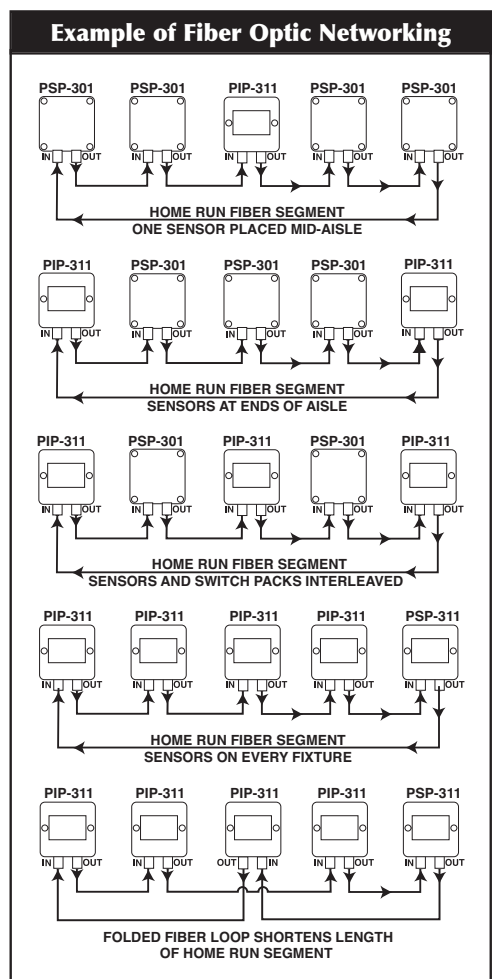
OBTAINING PLASTIC OPTICAL FIBER

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 2004 the cheapest version of ESKA suitable for PIP applications is Mitsubishi part number SH4001 with an attenuation of 0.2 db per meter.

This fiber is available in 500 and 1000 meter reels.



PSP-301 SPECIFICATIONS

Fixture Compatibility	HID with constant wattage autotransformer ballast
Step Dimming Method	Relay-switched capacitor
Switching Configurations	Series Switching/Capacitor-in-Sensor
Power Rating (Full Brightness)	4 amperes RMS or 400 Watts maximum
Range of Internal Capacitor	15uF@400VAC to 40uF@300VAC
Fixture Line Voltage Compatibility	120/208/240/277/347/480VAC
Sensor Power Consumption	3 watts maximum
Usable PIR range	50 feet on axis at 25°C floor temp
Fresnel Lens Pattern/Aisle	Area (PIP-910)
Ambient Temperature Range	0-50° C non-condensing
Observed Motion ON time	0-15 minutes (user adjustable)
Lamp Warm-up Interval	15 minutes (not adjustable)
Installation/Debug Assists	Magnetic Test Switch and Blinking LED
Mounting Options	1/2" NPT nipple
Mounting Bracket	1/2"NPT-to-1/2"NPT steel transition plate
Wire Harness	2 Conductor 18AWG stranded copper STOW
Wire Harness Length	48 inches
Harness Termination	Bare wire leads or fixture-specific connector
Off-center Weight	22 ounces without optional counterweight
Shipping Weight	2 lbs.
Enclosure Dimensions (including mounting nipple)	7" x 3.25" x 3.25"
UL File Number/Category	FNFT File No. E234927