M13AK0008
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Your Optical Fiber Solutions Partner ™

EZ-Bend ® InvisiLight ™
In-Living Unit Solution

WCC

Installation Instructions with InvisiLight NIU

Revision 3.0

1.0 **Overview**

The purpose of this document is to outline the process for installing InvisiLight WCC's new InvisiLight NIU. This document assumes that the technician is familiar with fiber handling and understands optimal placement of the FiberJack.

The InvisiLight ™ solution enables nearly invisible, fast, plug and play fiber placement into living units. The InvisiLight™ solution consists of a 0.9 mm diameter EZ-Bend ® fiber with factory mounted OFS SC-APC connectors on both ends. The InvisiLight™ solution is installed in the grooves between ceilings and walls, baseboards and walls, and vertical corners between walls, since they are easily accessed and naturally protected pathways to route the fiber. The connectorized assembly is available on small diameter spools in lengths of 5, 10, 20, 30, 40 meters (16, 33, 66, 99, and 132 feet) to reach into nearly any living unit. For very large residences, two InvisiLight fibers may be placed and connected through an SC-APC adapter enabling routing lengths of up to 244 feet.

Examples of Installed EZ-Bend ® InvisiLight ™ Solution




2.0 Tools and Components

2.1 Installation Tool and adhesive tube (sold separately)

Dispensing Tool

Adhesive Tube

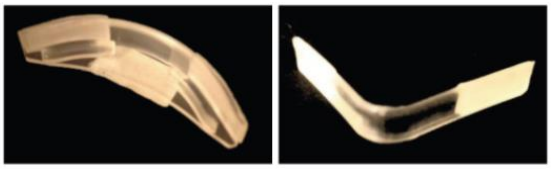
Nozzles

Dispensing Tool, Adhesive And Nozzle Loaded

2.2 Components

InvisiLight ™ Spool with Factory Mounted SC-APC Connectors

Inside and Outside Corners to insure proper bend radius of InvisiLight fiber around corners



Inside Corner mounting tool

Through wall tool

Hole plug and cap

InvisiLight NIU – base, cover, and installation kit.



3.0 Adhesive System Overview

3.1 The InvisiLight ™ adhesive is a water-based indoor adhesive that is tested to be fully compatible with the InvisiLight fiber. It provides a water-resistant bond without chemical smells, is acid-free, dries clear, and cleans up immediately with soap and water. An MSDS of the adhesive is available from OFS upon request.

3.2 Recommended installation surfaces:

- 3.2.1 Most common construction materials including brick, wood, dry-wall, plaster, wall paper, fabrics and painted surfaces

3.3 Not recommended for use on or with:

- 3.3.1 Metals that will corrode. Mirrors. Natural Marble (could stain) Polyethylene, polypropylene, Nylon™ or Teflon™

3.4 Installation conditions

- 3.4.1 Store adhesive tubes above freezing
- 3.4.2 Surfaces should be clean and dry
- 3.4.3 Application temperature >10°C (50°F)
- 3.4.4 Set Time and repositioning: 10 minutes.
- 3.4.5 Dry time: 1 to 24 hours (depending on thickness)
- 3.4.6 Dries clear within 1 – 3 hours depending on thickness.
- 3.4.7 Non-flammable, flexible solid, water resistant

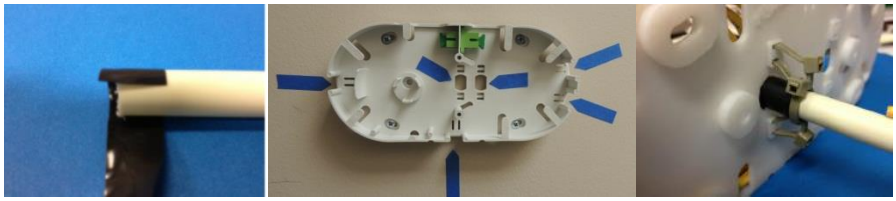
4.0 Installation Procedure

4.1 Start by identifying the desired location of the InvisiLight NIU.

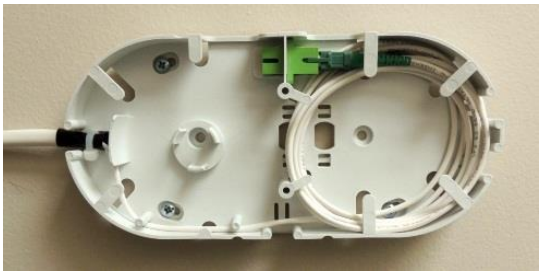
- 4.1.1 If possible try to locate the NIU in a less visible area such as in a closet, laundry room, or above a doorframe.
- 4.1.2 The location of the NIU may be dictated by the location of the fiber entry point.

4.2 Install the InvisiLight NIU

- 4.2.1 Secure the InvisiLight NIU to the wall at the desired location with screws and anchor posts included in the hardware kit.
  - 4.2.1.1 If microduct must enter from the rear of the NIU it will need to be attached with the cable ties included to the NIU prior to mounting the NIU.
- 4.2.2 Attach tape to the edge of the duct so that some of the tape is past the end of the duct edge. Attach the duct to one of the six ports and secure with the cable ties.



4.2.3 Route the slack cordage exiting the micro-duct in the base of the NIU and clean and plug in the SC-APC connector into the adapter. The spool is then placed in the module.



4.2.4 Do not attach the cover until the end of the installation. Unless the wall material is very weak, the module is light enough (<1 lb) that it does not need to be directly screwed into a wall stud.

4.3 Determine FiberJack Location and fiber pathway

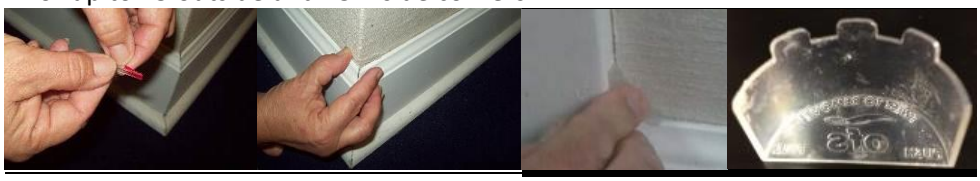
4.3.1 Based on the unit layout and customer requirement identify the optimal location of the FiberJack and obtain customer approval.

4.3.2 Identify and review the fiber path between the NIU and FiberJack and discuss the placement of the InvisiLight product with the unit owner and obtain their consent. The pathway may be in the groves between ceilings and walls, ceilings and crown molding, walls and crown molding, walls and door or window molding, and between baseboards and walls. The pathway may also be in the vertical groove at the intersection of 2 walls. Routing the fiber adjacent to the ceiling or crown molding may reduce the need to move furniture. Routing the fiber along baseboards may require furniture or other objects to be moved. The fiber may be routed through interior walls enabling faster installation and shorter path lengths.

4.4 Prepare the pathway for installation

4.4.1 Wall Penetrations - If the NIU is located in different room from the FiberJack, wall penetrations may be required. Utilizing a 3/8" (9mm) drill bit make the necessary penetrations as close as possible to the corners of the ceiling or walls. CAUTION: Prior to drilling check to be sure there are no electrical wires, pipes, or any other obstacles that may be in the path of the drill. If such obstacles are present move the hole location to where no obstacles exist, or route the fiber around the wall. Clean up debris resulting from drilling.

4.4.2 Corner Protectors - Install the plastic flat outside and inside corners provided with the InvisiLight kit, on your planned route. The corner anchor tool may be used to press on the inside corners in tight corners. The EZ-Bend ® fiber allows for up to 25 outside and 25 inside corners.



Remove adhesive backing	**Press-on outside corner protectors**	**Press-on inside corner protectors**	**Inside corner installation tool**

4.4.3 Select a spool of at least 3 meters (10 feet) longer in length than the measured pathway length. The table below recommends the spool length based on the measured pathway. This provides slack to account for measurement inaccuracy and connector replacement if needed, and changes in wall module location.

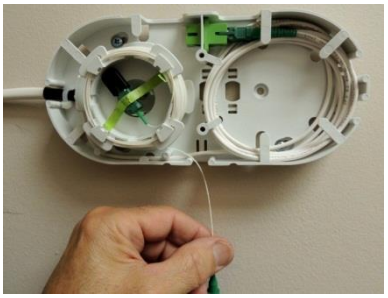
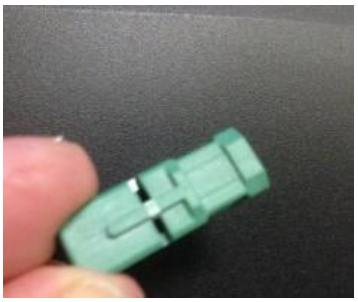
Measured Fiber Pathway Length	Spool Length for Installation
Up to 4 meters (13 feet)	5 meters (16 feet)
Up to 9 meters (29 feet)	10 meters (33 feet)
up to 17 meters (56 feet)	20 meters (66 feet)
up to 27 meters (89 feet)	30 meters (99 feet)
up to 37 meters (122 feet)	40 meters (132 feet)
37 – 54 meters (122 – 178 feet)	Concatenate* 40 + 20 or 30 + 30 spools
54 – 64 meters (178 - 211 feet)	Concatenate* 40 + 30 meter spools
64 – 74 meters (211 – 244 feet)	Concatenate* 40 + 40 meter spools

- Two spools may be concatenated (connected together) through a Wall module to achieve a reach of up to 74 meters (244 feet)

4.5 Pull the fiber from the NIU to the FiberJack location along the chosen pathway

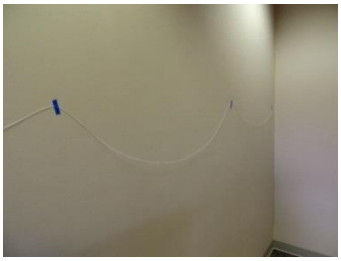
4.5.1 Place the spool into the NIU (shown below) and verify that it spins freely. If the Inside end connector catches when spinning then loosen the tape around the connector and move the connector so that the fiber can be pulled without catching. Carefully remove the tape holding the outside end connector to the

spool. The spool will be shipped with a green grip loosely slid onto the connector end. Remove the green grip shown below on the right and save it for later placement onto the connector prior to plugging the connector into the FiberJack.

4.5.2 Unspool the fiber along the selected route. Use "through wall" tool as shown below to push connector through any interior wall holes until connector is at the FiberJack location. For each wall hole, seat the connector in the tool, push through the wall, and rotate the tool ½ turn to release the connector. Remove the tool from the wall.

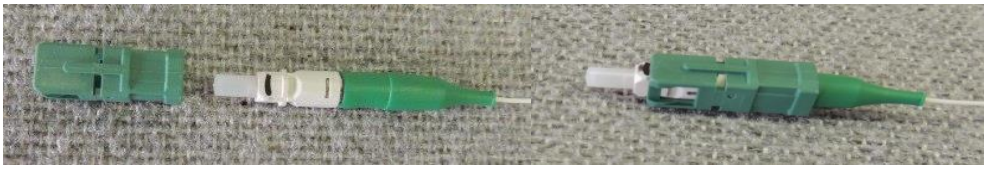
4.5.3 Use blue painter's tape or the green tape that was used to tape the connector to the spool to assist with keeping the InvisiLight fiber off the floor.



4.6 Install and Connect the FiberJack.

4.6.1 Route the InvisiLight fiber in the FiberJack plate.

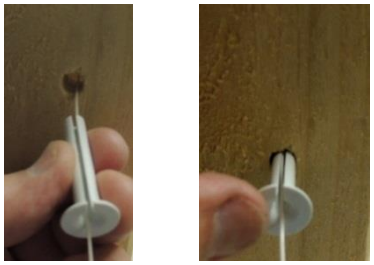
4.6.2 Slide on and snap on the connector grip (supplied with the spool assembly). The grip key must be aligned with the mark on the connector to make sure that the ferrule end face angle is in the correct position as shown below. An audible click will be heard when the grip has been fully seated.



4.6.3 Remove dust cover and clean the fiber connector end with Cletop cleaner and connect to the FiberJack then secure to the wall.

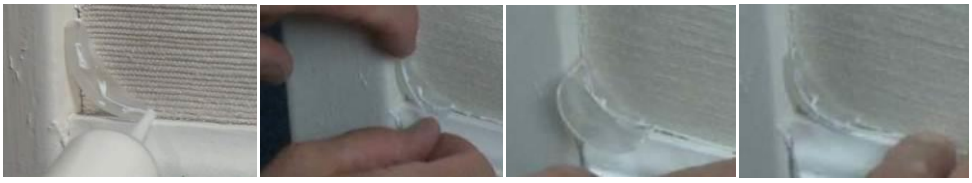
4.7 Adhere the InvisiLight Fiber into place. Work from the FiberJack toward the NIU by applying very small 1 mm line of adhesive (about the same diameter as the fiber) in 3 to 10 ft lengths. Pull an index finger along the path over the fiber while gently pressing it in to the adhesive. Latex gloves or a finger cot may be worn to avoid contact with the adhesive if desired. Have a small wet towel to remove excess adhesive if needed. When reaching an interior wall hole, pull through slack and install the hole plug and cap per 4.7.1.6. Install fiber on corner protectors per 4.7.2. Continue this process until the NIU is reached.

4.7.1 Though Hole Cap and Plug Installation - As Apply two dots of adhesive under flange of hole plug where shown. Slide fiber into hole plug slot, push hole plug into hole and seat flange on to wall such that adhesive tack holds the hole plug to the wall.. Align cap slot with fiber and carefully press cap onto hole plug. CAUTION: Failure to align fiber with cap slot will break the fiber when the cap is pressed-on.



4.7.2 Routing fiber on corner protectors. At every outside and inside corner be sure to place the fiber on to a pre-installed corner protector. IF THERE IS A CORNER PROTECTOR MISSING FROM ANY CORNER, PRESS-ON A CORNER PROTECTOR AT THAT CORNER, AND RESUME THE FIBER PLACEMENT. IF BENDING THE FIBER ON AN OPEN WALL MAINTAIN A 5 MM MINIMUM BEND RADIUS.

The photos below show the placement of inside corner protectors. The fiber must be inserted in the routing slot as shown. The corner anchor tool in the third image can be used to push the fiber into the slot.



The photo below shows the placement of the outside corner protectors. The fiber must be routed over the corner protector as shown to maintain the 5 mm minimum fiber bend radius.

4.8 NIU Connection

4.8.1 Once all the InvisiLight fiber is adhered into place, recoil all unused fiber on to the spool, place the cover on the NIU base, and screw in the white cover retention screw.

4.8.2 Clean fiber connector with Cleotop cleaner and plug connector on the left side of the bulkhead.

4.9 Power test for proper light levels at the FiberJack.

5.0 Trouble-shooting and Repair

5.1 Trouble-shooting: If test results show excessive loss or no light, inject a “red light” into the connector on either end of the Fiber and the red light will visibly leak at any point where excessive loss or a fiber break exists.

5.2 Repair procedures depending on location of fiber break. (NOTE: Fiber breaks are very rare and will not occur if the InvisiLight is installed in accordance with instructions.)

5.2.1 Fiber is broken just behind the connector on either end

5.2.1.1 Remove the connector from the adapter

5.2.1.2 Cut off the connector behind the break.

5.2.1.3 Replace it with a company approved fusion splice-on

5.2.1.4 Plug in the new connector into the adapter.

5.2.2 Fiber is broken near the FiberJack

5.2.2.1 Cut off the fiber past the fiber break, and replace it with a company approved fusion splice-on SC-APC pigtail or connector with length sufficient to reach the FiberJack.

5.2.2.2 If a pigtail is used attach the fusion splice protector to the wall or molding with tape or adhesive.

5.2.2.3 Attach loose fiber to the wall or molding with adhesive as needed.

5.2.3 Fiber is broken near the NIU

5.2.3.1 Unplug the connector from the NIU adapter.

5.2.3.2 Unspool enough slack to reach the break plus enough additional to perform fusion splicing.

5.2.3.3 Fusion splice the broken end to the slack end.

5.2.3.4 Attach the fusion splice protector to the wall or molding with tape or adhesive, and roll back the remaining slack onto the spool.

5.2.3.5 Attach loose fiber to the wall or molding with adhesive as needed.

5.2.3.6 Plug in the connector into the NIU adapter and re-secure the spool into place.

5.2.4 Fiber broken more than a few feet from either end

5.2.4.1 Unplug and cut-off the connectors and install another InvisiLight ™ fiber spool over the same path as the existing fiber.

6.0 ORDERING INFORMATION

WCC Kits include the follow components:	Qty
a) Connectorized SCA/SCA 900um fiber spool	1
b) Wall mount WCC module e/w SCA adapter	1
c) Inside corner protectors	6
d) Outside corner protectors	6
e) Hole plugs and caps	4
f) Tube 30ML Adhesive (12 month expiration)	1
NVSLGHTC-D-SCASCA-MODWCC KIT-05M-01/EA	301092342
NVSLGHTC-D-SCASCA-MODWCC KIT-10M-01/EA	301092359
NVSLGHTC-D-SCASCA-MODWCC KIT-20M-01/EA	301089546
NVSLGHTC-D-SCASCA-MODWCC KIT-30M-01/EA	301089553
NVSLGHTC-D-SCASCA-MODWCC KIT-40M-01/EA	301089561

NVSLGHTC-WCC MODULE E/W SCA ADAPTER	
NVSLGHTC-WCC MODULE E/W SCA ADAPTER	301092193

NVSLGHTC-ADHESIVE (includes 2 tips)	
NVSLGHTC-TUBE, 30ML ADHESIVE	301083184

"Try Me Out Kit" includes the follow components:		Qty
a) Connectorized SCA/SCA 900um fiber spools 30 meters	301088936	10