SUMITOMO RECOMMENDED PROCEDURE

SRP SP-F05-007

Assembling U-HSX Gen 2 (Ultra Hyper Scale Exchange) Installation

SUMITOMO ELECTRIC LIGHTWAVE CORP.
201 South Rogers Lane, Suite 100, Raleigh, NC 27610
(919) 541-8100 or 1-800-358-7378
www.sumitomoelectriclightwave.com
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1.0 General

Recommended Procedure for mounting the U-HSX (Ultra Hyper Scale Exchange – slotted cable) cabinet in the workplace, along with detailed procedures for installing and routing high count ribbon slotted cables within the internal devices of the cabinet, as well as steps to setup the mass fusion splicing operation.

2.0 Safety Precautions

2.1 The use of safety equipment is strongly recommended during the installation and handling of optical fiber cable.

2.2 To protect the hands, gloves are recommended when handling cables with armor.

3.0 Reference Documents

SP-F02-008 864f Ribbon Indoor Riser Cable Preparation
SP-F02-029 1728f Ribbon Slotted Core Cable Preparation
SP-F02-031 3456f Ribbon Slotted Core Cable Preparation
ETK1524037 Splicing Pliable Ribbons

4.0 Tools Required

The following is a list of tools and materials required to complete this procedure.

1. Tape Measure
2. Utility Knife
3. Cable Cutters
4. PVC Cutter for up to 1-1/4“ (Greenlee 864)
5. IDEAL Wire Marker Booklet (#44-101)
6. Sumitomo Ribbon Separator Jig
7. Splicer’s Scissors
8. Marking Pen
9. Needle Nose Pliers
10. Gloves
11. Safety Glasses

5.0 U-HSX Features

5.1 Dimensions

The cabinet measures 60” H x 56” W x 20” D. and will require a wall space area of approximately 7’ x 10’ in order to efficiently mount entrance cables and to establish a comfortable work operation setup for fusion splicing.

Figure 1

5.2 Cabinet Mounting

In the interior of the cabinet locate the ½” mounting holes in the four corners of the unit and two in the middle for a total of six. The options for mounting include the use of lag bolts directly into the wall / studs, or the use of the Uni-strut setup. The crated weight of the cabinet is 800lbs and the uncrated weight of the cabinet is 400 pounds.

Figure 2

5.3 Cable Entrance Port Access

There are two shingle designs for the placement of the cord connectors to suit the installation of the entrance cables. Each of the two shingle designs has its own port size.

On the left hand side, the side shingle locations have 1.75” openings, capable of accepting cord connectors for the various size inside-plant cables.

On the right hand side, at top and bottom shingle locations, there are 2.125” ports for accepting the cord connectors that will secure the OSP cables in place.

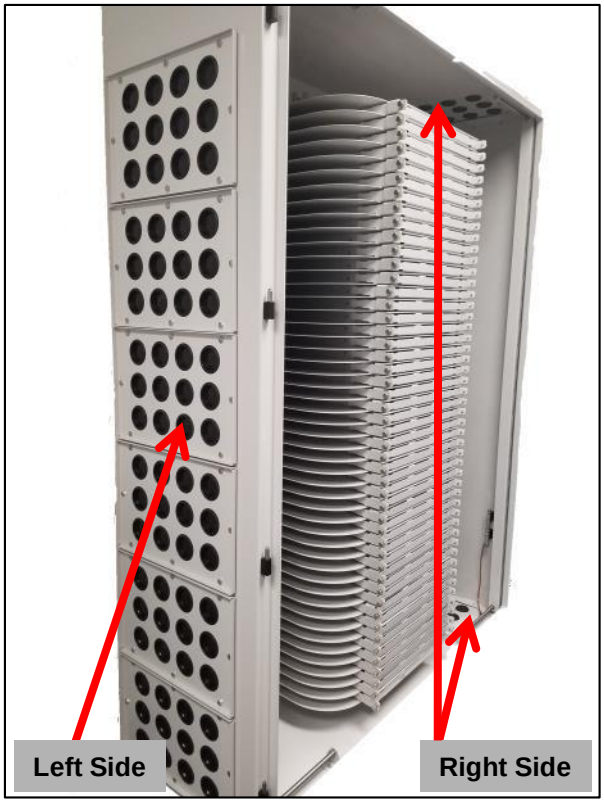

Figure 4

5.4 Cabinet Door Features

The cabinet door is a two-piece unit with a four point catch at the top, bottom, and two near he center handle position. With the doors opened, both halves are removable by a simple lifting motion, allowing for an open work space, then re-installed by inserting the door pins into the attached hinge pieces.

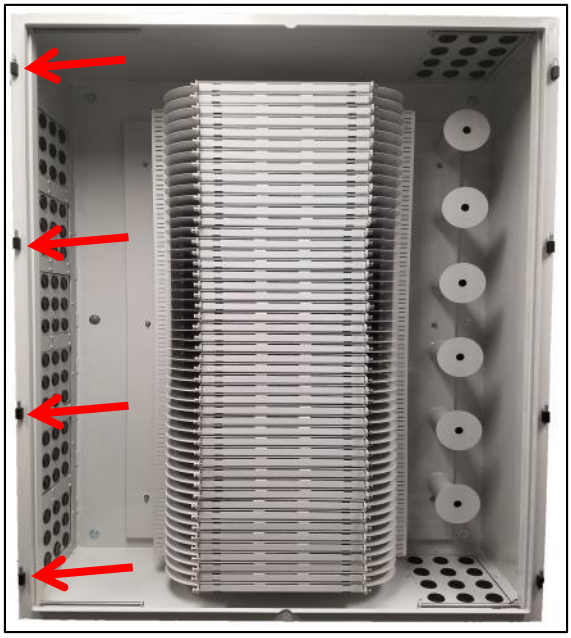

Figure 5

5.5 Cabinet Grounding

The grounding buss bar for the OSP cables is located in the interior of the lower right hand side and is connected to the cabinet side wall with a #6 ground wire.

From this point of grounding on the cabinet side wall, a second #6 ground wire should be run by the installer to the established building ground to complete the electrical requirement.

Figure 6

6.0 Slotted Core Cable Installation

6.1 Sheath Preparation

In order to store and splice the pliable ribbon bundles correctly, the length of exposed ribbons for both the OSP and Inside Plant cables is important in conforming to the route of the ribbons from the cord connector to the mass fusion splice machine.

The minimum length of exposed pliable ribbon bundles needed to route through position #6 on the OSP side to perform the fusion splicing operation, is 152 inches. For position # 5 the length can be reduced by 10 inches. The same reduction in length applies to positions #4 down to #1. Maintain at least 52 inches in the splice tray and 28 inches in the slack storage to be able to extend the tray for splicing operations.

On the ISP cable side the minimum of 94" is needed for all positions. The cables route directly over to the splice trays. Maintain at least 52 inches in the splice tray and 28 inches in the slack storage to be able to extend the tray for splicing operations.

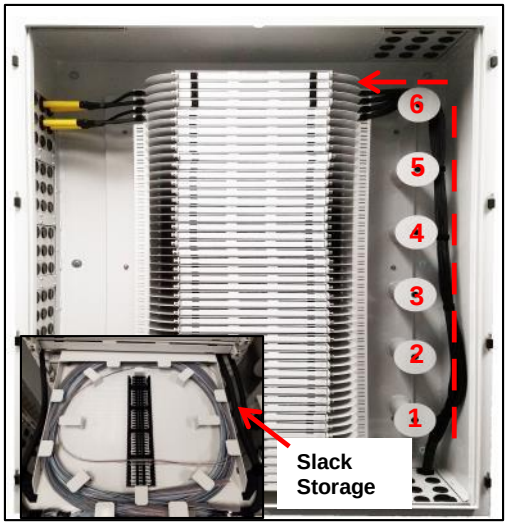

Figure 7

6.2 Sheath Preparation Protective Sock

A protective sock material is recommended to be placed during the sheath preparation procedure, which will protect the exposed bundles of pliable ribbons.

(The sock is to be used for ribbon separation/protection from cable butt to the splice tray). The protective sock should be placed over the ribbons leaving 52 inches of exposed ribbons that will be routed into the splice tray.

Note: (Expandable Braided Sleeve material from FLEXO, part # 63BK, cable range = 5/8" to 1-1/4" O.D.).

Once the sheath and slotted core material has been removed, make sure that the 8 bundles of 432 fibers are identified/tagged and hand tighten the plastic cable grommet into the shingle opening.

Note: To assist in the removal of the slotted core material and expose the metallic CSM, a tool is available from Greenlee, called the CAT864 tool.

Figure 8

6.3 Installation of Cord Connectors for OSP Cables

For the shingle use on the OSP cable side, there is one on the top and one on the bottom to meet the typical entry position of outside plant entrance cables.

There are (12) port openings on each of these shingles, measuring 2.125" in diameter, and they will accept cord connectors capable of securing an OSP cable with an O.D. up to 1.5".

The fiber capacity for this cabinet is 41,472 fibers. Maximum for each splice tray is 864f/48 trays, which equates to (12) 3456F slotted cables. This maximum capacity will hold true regardless of the cable configuration. All of the bundles of pliable ribbons from these cables will be socked by slot (432f per slot) and routed over one of the (6) mandrel positions and then secured by Velcro straps to the frame. Route two socks to each splice tray for a total of 864 fibers.

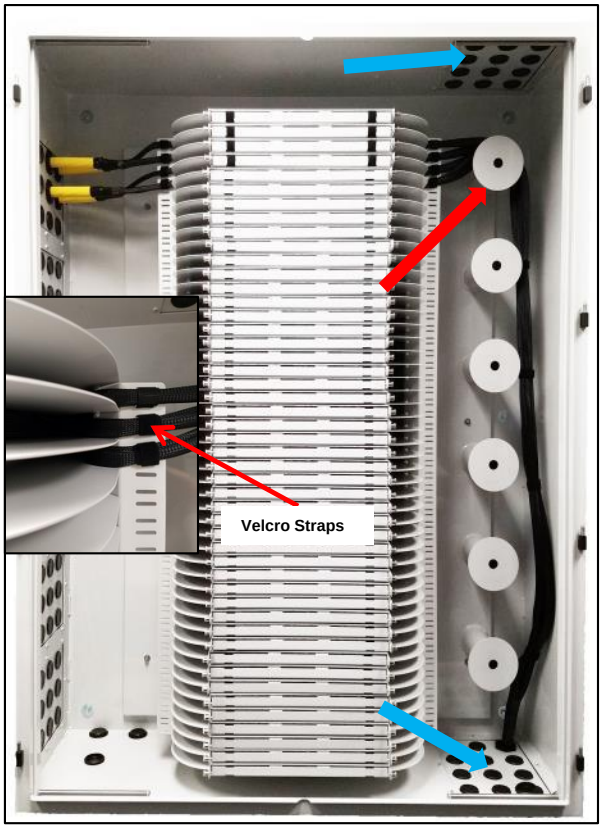

Figure 9

6.4 Cord Connector Installation for OSP Cables

There is no required cable placing pattern for the 3456F cables. Figure 10 shows a suggested pattern to best help keep the cables in a sequence working from the top/down of the cabinet.

The placement of (12) 3456f cables requires either shingle (top or bottom) and all of the openings are required. This setup will best line up the cables to the corresponding mandrels above.

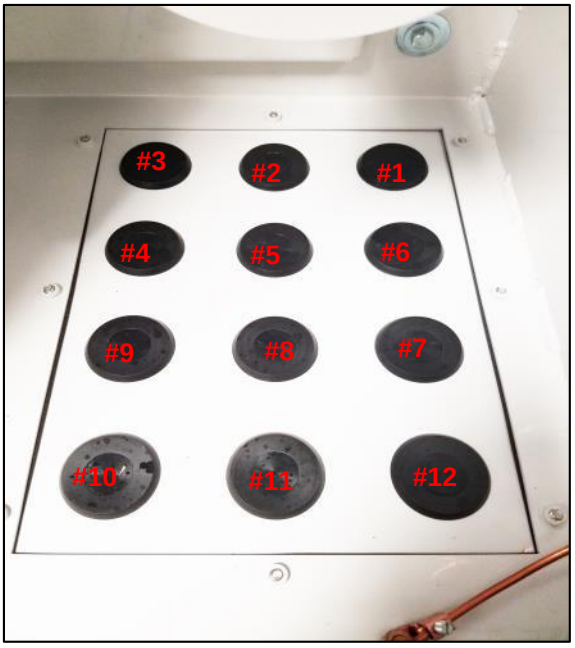

Figure 10

6.4 Cord Connector Installation for Inside Plant Cables

The shingles on the ISP cable portion of the U-HSX, top and side areas, have port openings measuring 1.75", which will accept a cord connector that will secure a cable up to the 1.1" diameter.

Each shingle is designed to accept 12 cord connectors. This gives more flexibility when using different fiber count cables. This particular application will be using 864 fiber cables. By designating (8) ports on the left for (8) 864 fiber cables and attaching to the frame using Velcro straps the fibers can be routed to the (8) appropriate splice trays.

In cases where the ISP cables may be of different sizes, such as 576 fibers the number of cord connectors required per shingle will increase from 8 to 12 respectively. The use of the cord connector will provide a safe cable pull-out feature, as required.

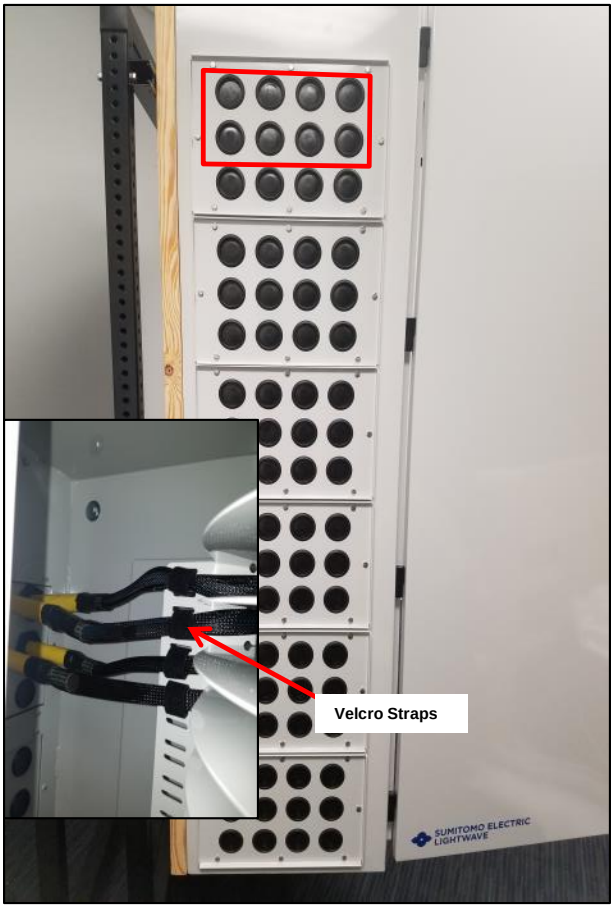

Figure 11

6.8 Splice Tray Design

The splice tray measures 31" L x 15" W x 0.75" H, and is open on each side with multiple points for installing tie wraps and transportation sock to secure the ribbons. The ribbons are placed in the tray with adequate ribbon slack for re-burns and to reach the splicer on the splicer platform.

The center strip can accommodate (72) mass fusion splice sleeves, (36) double stack holders, for a splice tray capacity of 864 fibers.

The integrity of the completed splices is provided by a clear removable tray cover. The tray covers can be removed during splicing operations and re-attached when splicing operations are complete. Each splice tray has its own independent compartment for storage.

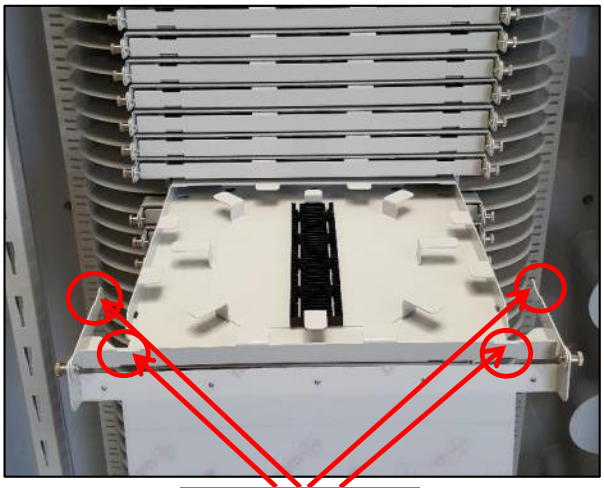

Figure 12

6.9 Bundle Identification for OSP Cables

The identification process for labeling the ribbon bundles is critical to the success of the fusion splicing operation. After having determined the bundle count (432 fibers in 8 bundles for the 3456-cable, tag the bundles 1 to 8 for each slot. These photos offer suggested ways of identifying the ribbon bundles in addition to local practices.

At the cable choke point identify the slot that contains bundle #1 by referring to the cable design specification, Slotted Core Ribbon Cable. From this cable construction specification note the black line markings on the slotted core ribs that identifies bundle #1, and in which direction #2 is located. Begin the tagging exercise with this information, rotating around the core.

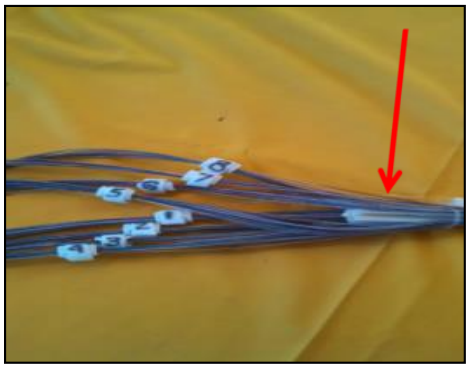

Figure 13

6.10 Bundle Identification for OSP Cables

As noted in section 6.1 Sheath Preparation, the length of exposed ribbons is important to the proper setup of the fusion splice machine operation, likewise the identification tagging of the ribbon bundles is equally important at both ends of the exposed ribbon bundles. Should there be a maintenance need to locate and test a fiber/ribbon, keeping the identification tags in place at the choke, coupled with the same order of markings on each splice tray, will aid in the tracing and accessing of the correct ribbon bundle within the ribbon sock route.

Figure 14

6.11 Bundle Identification for Inside Plant Cables at the Shingle

As with the organizing of the bundles for the OSP cables, there is a process for making bundles with the 864f Inside Plant cables so that they match to the 432F bundle size for the 3456 fiber cable. The (4) 864f Inside Plant cables (3456 fibers) that enter the shingle and are each secured with a cord connector, need to be tagged with cable identification info and bundle number, such as noted in the photo. First cable is fibers 1 thru 864, second cable is 865 thru 1728, third cable is 1729 thru 2592, and the fourth cable is fibers 2593 thru 3456.

Figure 15

6.12 Bundle Identification for OSP Cables at the Splice Machine

With the OSP entrance cable being the 3456F, (4) splice trays will be used containing 864 fibers each. To match the ribbon count of the OSP cable with the ISP cables, the first 432F OSP bundle (#1), will splice to fibers 1-432 of the (#1) ISP cable and the (#2) bundle of the OSP cable will splice to the (#1) ISP cable fibers 433-864. *(This same sequence will be used thru all 4 ISP cables as bundle and cable numbers increase for each 3456f segment).*

6.14 Fusion Splice Machine Set-up

The fusion splice machine equipment and supplies will be setup on a splice platform that attaches to sliding vertical brackets. The brackets can be slid out from the sides of the cabinet when splicing operations begin.

Figure 16

The 52 inches of ribbon slack in the tray should provide enough length to reach the fusion splicer even if an occasional re-burn is required. Once splicing operations are complete the vertical brackets can be slid back out of the way against the cabinet walls.

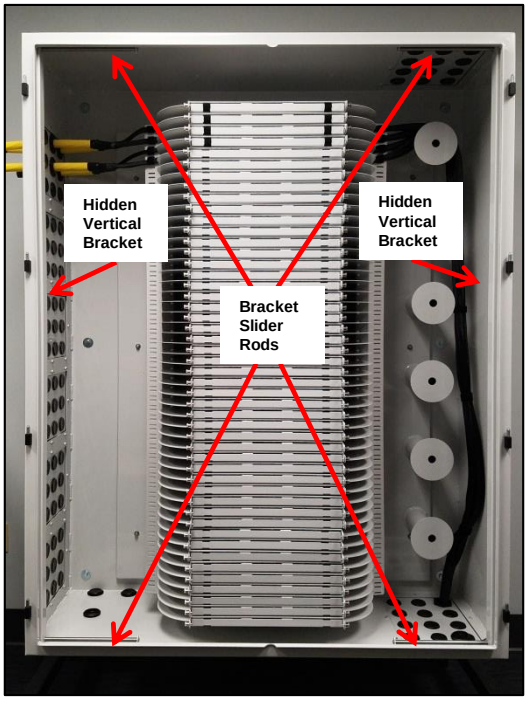

Figure 17

6.15 Materials Kit

Item#	Quantity	Description
1	4 pieces	Strut Channel Nuts, with Springs, Zinc Plated,
2	4 pieces	Zinc Plated Steel Oversized Flat Washer,
3	4 pieces	Zinc-Plated Steel Cap Screw
4	4 pieces	Black Liquid Tight Cord Grip (.787" to 1.02" range)
5	1 piece	Cable Gland, Grip Range (.944" to 1.515")
6	1 piece	Nut
7	50 pieces	Double sided velcro 3/4" wide
8	1 roll	15 ft. Roll of 1/2" Velcro Additional wrap for use within tray)
9	1 roll	75 ft. Roll of Black 5/8" Expandable Braided Sleeving.
10	1 assembly	Splice Platform Assembly for U-HSX, Gen2