LANmark-OF ENSPACE UHD
Patch Panel

PRODUCT INSTALLATION GUIDE

December 2024 v2.0

aginode

LANmark-OF ENSPACE UHD Patch Panel
PRODUCT INSTALLATION GUIDE

Product References

Part Number	Description
NSPACE.PP1U	LANmark-OF ENSPACE UHD Patch Panel 1U 12x Modules Black
NSPACE.PP2U	LANmark-OF ENSPACE UHD Patch Panel 2U 24x Modules Black
NSPACE.PP4U	LANmark-OF ENSPACE UHD Patch Panel 4U 48x Modules Black

Document information

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Important Notice

General

Installation is to be performed by qualified service personnel.

The installation of the LANmark-OF ENSPACE patch panels must be carried out with care and precision.

Prior to panel installation in a cabinet, preparation work should be carried out on a clean and level work-surface.

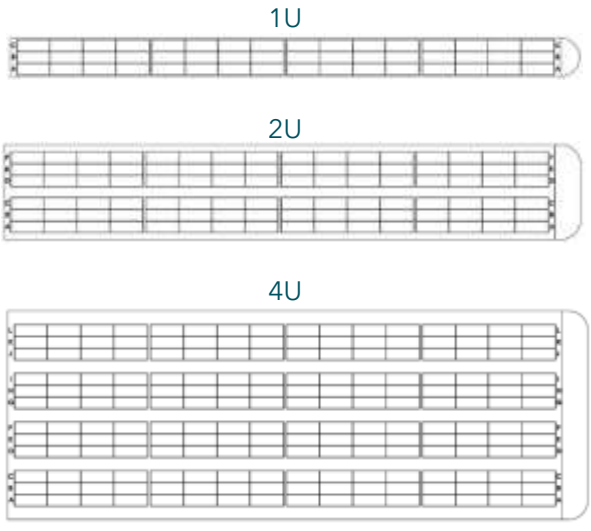
Each patch panel is supplied with:

- 4 cage-nuts with screws (1U & 2U panels)

- 8 cage-nuts with screws (4U panel)

.

- 1 labelling strip



All other ancillaries (e.g. adaptor modules) must be purchased separately.
The product part numbers are mentioned where applicable in the following.

Product references

LANmark-OF ENSPACE UHD Patch Panel 1U 12x Modules Black

Part Number: **NSPACE.PP1U**

LANmark-OF ENSPACE UHD Patch Panel 2U 24x Modules Black

Part Number: **NSPACE.PP2U**

LANmark-OF ENSPACE UHD Patch Panel 4U 48x Modules Black

Part Number: **NSPACE.PPP4U**

Features of the products

LANmark-OF ENSPACE UHD Patch Panel 1U 12x Modules Black (144 fibres)

The patch panel is fully assembled and includes

- a 19'' chassis with a removable lid
- a hinged front cover
- 3 sliding trays that can be equipped with up to 3x 4 optional modules

- a sliding and tilting rear drawer equipped with loop rings and 2 supports for 20 mm glands

  Note: A third support for glands can be ordered separately

LANmark-OF ENSPACE UHD Patch Panel 2U 24x Modules Black (288 fibres)

The patch panel is fully assembled and includes

- a 19'' chassis with a removable lid
- a hinged front cover
- 6 sliding trays that can be equipped with up to 6x 4 optional modules

- a sliding and tilting rear drawer equipped with loop rings and 2 supports for 20 mm glands

Note: A third support for glands can be ordered separately

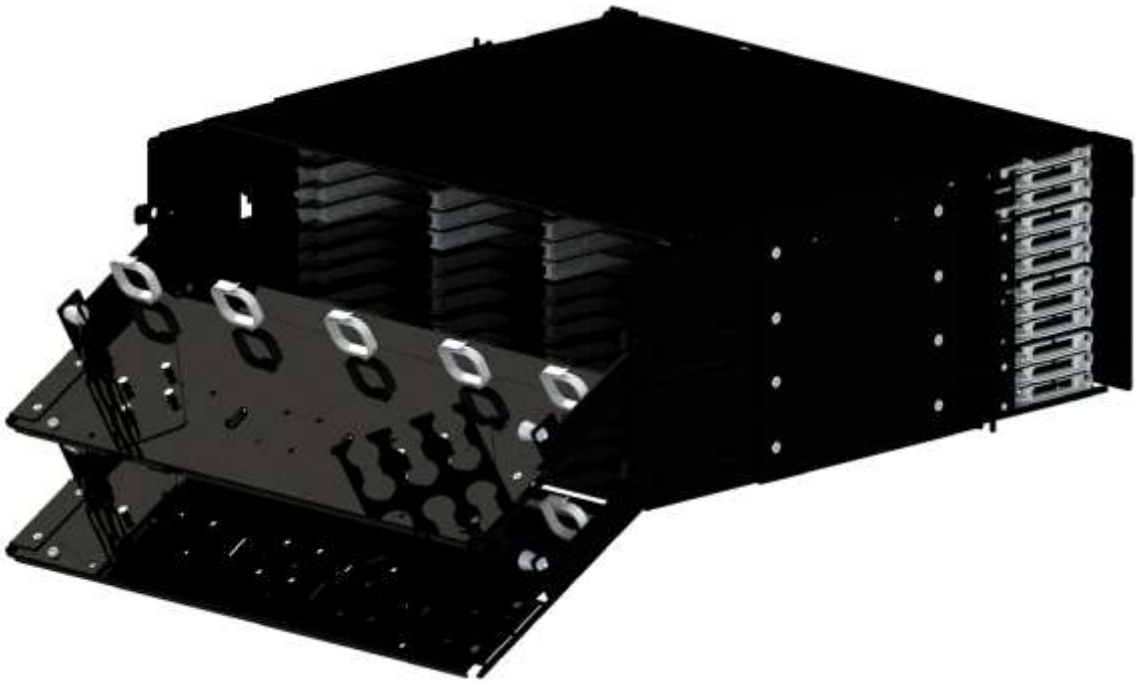
LANmark-OF ENSPACE UHD Patch Panel 4U 48x Modules Black (576 fibres)

The patch panel is fully assembled and includes

- a 19'' chassis with a removable lid
- a hinged front cover
- 12 sliding trays that can be equipped with up to 12x 4 optional modules

- Two sliding and tilting rear drawers each equipped with loop rings and 2 supports for 20 mm glands

Note: Two additional supports for glands can be ordered separately



Note: The 4U patch panel is supplied with 8 cage-nuts with screws

Optional modules and accessories

4 types of configurations of the ENSPACE UHD patch panels are possible:

- LC modules with LC pre-terminated assemblies
- MTP/LC modules with MTP pre-terminated assemblies
- MTP modules with MTP pre-terminated assemblies
- LC modules loaded with splice holders for pigtail splicing on OF cables

Important Note

LANmark-OF ENSPACE pre-terminated assemblies shall be selected to ensure compatibility with the ENSPACE UHD patch panels and modules.

A. LC adaptor modules

Part Number	Description
NSPACE.PLC12AS	LANmark-OF ENSPACE Adaptor Module 12 LC Multimode Aqua Shutters Integrated
NSPACE.PLC12VS	LANmark-OF ENSPACE Adaptor Module 12 LC Multimode Violet Shutters Integrated
NSPACE.PLC12LS	LANmark-OF ENSPACE Adaptor Module 12 LC Multimode Lime Green Shutters Integrated
NSPACE.PLC12BS	LANmark-OF ENSPACE Adaptor Module 12 LC Singlemode Blue Shutters Integrated
NSPACE.PLC12GS	LANmark-OF ENSPACE Adaptor Module 12 LC/APC Singlemode Green Shutters Integrated

NSPACE.PLC12AS NSPACE.PLC12VS NSPACE.PLCLS

NSPACE.PLC12BS NSPACE.PLC12GS

Optional modules and accessories

B. MTP adaptor modules

Part Number	Description
NSPACE.PMTP2A	LANmark-OF ENSPACE Adaptor Module 2x MTP Multimode Key Up Key Down Aqua
NSPACE.PMTP4A	LANmark-OF ENSPACE Adaptor Module 4x MTP Multimode Key Up Key Down Aqua
NSPACE.PMTP6A	LANmark-OF ENSPACE Adaptor Module 6x MTP Multimode Key Up Key Down Aqua
NSPACE.PMTP2V	LANmark-OF ENSPACE Adaptor Module 2x MTP Multimode Key Up Key Down Violet
NSPACE.PMTP4V	LANmark-OF ENSPACE Adaptor Module 4x MTP Multimode Key Up Key Down Violet
NSPACE.PMTP6V	LANmark-OF ENSPACE Adaptor Module 6x MTP Multimode Key Up Key Down Violet
NSPACE.PMTP2U	LANmark-OF ENSPACE Adaptor Module 2x MTP Multimode Key Up Key Up Grey
NSPACE.PMTP4U	LANmark-OF ENSPACE Adaptor Module 4x MTP Multimode Key Up Key Up Grey
NSPACE.PMTP6U	LANmark-OF ENSPACE Adaptor Module 6x MTP Multimode Key Up Key Up Grey
NSPACE.PMTP2G	LANmark-OF ENSPACE Adaptor Module 2x MTP Singlemode Key Up Key Down Green
NSPACE.PMTP4G	LANmark-OF ENSPACE Adaptor Module 4x MTP Singlemode Key Up Key Down Green
NSPACE.PMTP6G	LANmark-OF ENSPACE Adaptor Module 6x MTP Singlemode Key Up Key Down Green

NSPACE.PMTP2A

NSPACE.PMTP4A

NSPACE.PMTP6A

NSPACE.PMTP6G

Important notes about MTP polarity (MTP/MTP links)

Aginode recommend the use of MTP pre-terminated assemblies with polarity method B when working with MTP/MTP links.

Key up / Key down MTP adaptors are standard and shall be selected to maintain the polarity in most of the cases and especially when working with the polarity method B. They are also the only one suitable for Singlemode MTP connectors as these are APC polished.

Key up / Key up MTP adaptors can't be used with Singlemode MTP connectors as their position can't be reversed due to the angled polishing of their end face.

Key Up / Key up MTP adaptors are required in some specific circumstances i.e. when migrating from links working with the polarity method C that were used together with MTP/LC modules.

C. MTP/LC modules

Part Number	Description
NSPACE.MSLC12AS	LANmark-OF ENSPACE MTP-Module Straight 12 LC Multimode Aqua Shutters Integrated
NSPACE.MSLC12VS	LANmark-OF ENSPACE MTP-Module Straight 12 LC Multimode Violet Shutters Integrated
NSPACE.MSLC12LS	LANmark-OF ENSPACE MTP-Module Straight 12 LC Multimode Lime Green Shutters Integrated
NSPACE.MSLC12BS	LANmark-OF ENSPACE MTP-Module Straight 12 LC Blue Shutters Integrated
NSPACE.MSLC12GS	LANmark-OF ENSPACE MTP-Module Straight 12 LC/APC Singlemode Green Shutters Integrated
NSPACE.MCLC12AS	LANmark-OF ENSPACE MTP-Module Crossed 12 LC Multimode Aqua Shutters Integrated
NSPACE.MCLC12VS	LANmark-OF ENSPACE MTP-Module Crossed 12 LC Multimode Violet Shutters Integrated
NSPACE.MCLC12LS	LANmark-OF ENSPACE MTP-Module Crossed 12 LC Multimode Lime Green Shutters Integrated
NSPACE.MCLC12BS	LANmark-OF ENSPACE MTP-Module Crossed 12 LC Blue Shutters Integrated
NSPACE.MCLC12GS	LANmark-OF ENSPACE MTP-Module Crossed 12 LC/APC Singlemode Green Shutters Integrated

NSPACE.MSLC12AS

NSPACE.MSLC12VS

NSPACE.MSLC12LS

NSPACE.MSLC12BS

NSPACE.MSLC12GS

Important notes about MTP polarity (MTP/LC modules)

Aginode recommend the use of MTP pre-terminated assemblies with polarity type C when working with MTP/LC modules.

Straight MTP/LC modules are standard and shall be selected to maintain the polarity in most of the cases and especially when working with the polarity method C.

To migrate from10G to 40/100G when working with polarity method C, the two MTP/LC cassettes have to be replaced with MTP adaptor modules. To maintain the polarity, key up / key up adaptors have to be installed on one end of the link and key up / key down adaptors on the other end.

D. Pigtail splicing

LC adaptor modules can be loaded with a splice holder to allow pigtail splicing.
LC modules are supplied with two splice holders: the first one being suitable for heat shrink splice protection and the other one for aluminium splice protection.
The splice holder can be loaded with 12 heat shrinkable or 12 aluminium splice protections.

Note: When working with the holder for heat shrinkable splice protection 2 protected splices have to be installed on top of each other in each of the 6 available locations (see page 31).

Important note

As the available space dedicated to the storage of the fibres is limited in the modules Aginode mandate the use of maxi-strip pigtails. Tight Buffer pigtails shall not be selected.

For the same reason, only cable structures containing 250µm coated fibres shall be used (Loose Tube or Micro-Bundle structures). Tight Buffer (TB) cable structure containing 900µm fibres shall not be selected.

Construction of the fanouts of the Micro-Bundle cables
Micro-Bundle cables contain bundles of 12 fibres. During onsite termination, each bundle shall be terminated in a LC adaptor module.
Therefore, it is required to fix the end of the cable at the back of the patch panel using a gland and to protect the bundles (and the fibres) all along their path to the modules.
The construction process is described further in this guide.

Cable brackets

Part Number	Description
NSPACE.PPCB1U4S	LANmark-OF ENSPACE Patch Panel Cable Bracket 1U 4 slots
NSPACE.PPCB2U8S	LANmark-OF ENSPACE Patch Panel Cable Bracket 2U 8 slots

Cable glands

Part Number	Description
N890.148	LANmark-OF Cable Gland Rubber Boot 20 mm 10X

Note: suitable for cable diameter from 4.0 mm to 7.8 mm

Fibre protection tube

Part Number	Description
N890.051	LANmark-OF Fan-out 3mm Tube 25m Aqua
N890.052	LANmark-OF Fan-out 3mm Tube 25m Violet
N890.053	LANmark-OF Fan-out 3mm Tube 25m Lime Green
N890.050	LANmark-OF Fan-out 3mm Tube 25m Yellow

Adhesive heat shrinkable sleeve

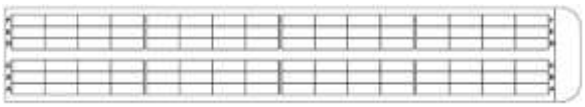
Part Number	Description
N890.060	LANmark-OF Heat Shrink Fan-Out 10X

Labelling strips

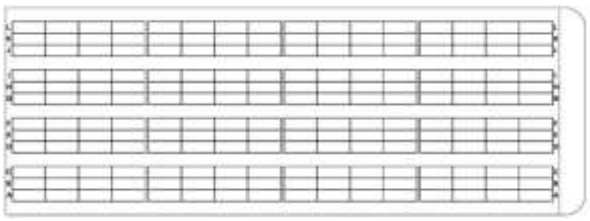
Part Number	Description
NSPACE.PPLB1U	LANmark-OF ENSPACE UHD Port Labels 1U 10x
NSPACE.PPLB2U	LANmark-OF ENSPACE UHD Port Labels 2U 10x
NSPACE.PPLB4U	LANmark-OF ENSPACE UHD Port Labels 4U 10x

1U

2U

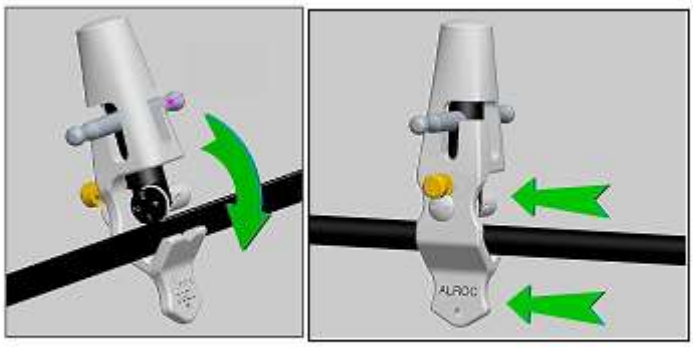


4U



OF cable stripping tools and accessories

The Aginode recommended jacket stripping tool, adapted to Micro-Bundle (MB) cable structure, has been developed to cut the jacket longitudinally and around as shown here below.



OGCL stripping tool - NCS part number: N890.131

In Micro-Bundle cables the fibres are contained in an advanced flexible LSZH tube having a diameter of 1.3mm.
The tubes contain a small amount of jelly. As a consequence, the fibres need to be cleaned before the termination process.

Recommended materials

- Stripper tool (**Multi-Wire stripper 821 - Ripley / Miller** or equivalent)
- Low-lint paper (**LANmark-OF Wipes for Anaerobic Toolkit – N102.226** or equivalent)
- Fibre degreaser

Splicing accessories

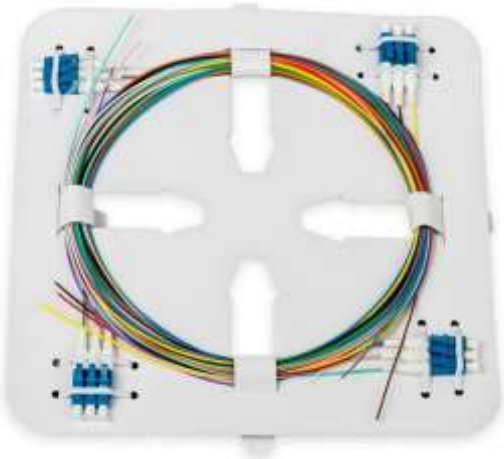
Part Number	Description
N890.021	LANmark-OF Fusion Splice Heat Shrink Protection 45mm 100x
N890.003	LANmark-OF Fusion Splice Aluminum Protection 150x
N890.004	LANmark-OF Tool For Aluminum Fusion Splice Protection

Pigtails

Part Number	Description
N121.5MLS (*)	LANmark-OF Pigtail LC OM3 Maxistrip LSZH 50/125 1m 12 Colours
N121.7MLS (*)	LANmark-OF Pigtail LC OM4 Maxistrip LSZH 50/125 1m 12 Colours
N121.5MLA	LANmark-OF Pigtail LC OM3 Maxistrip LSZH 50/125 1m Aqua
N121.7MLA	LANmark-OF Pigtail LC OM4 Maxistrip LSZH 50/125 1m Aqua
N121.7MLV	LANmark-OF Pigtail LC OM4 Maxistrip LSZH 50/125 1m Violet
N121.9MLL	LANmark-OF Pigtail LC OM5 Maxistrip LSZH 50/125 1m Lime Green

Part Number	Description
N121.4MLS (*)	LANmark-OF Pigtail LC/UPC Singlemode Maxistrip LSZH 9/125 1m 12 Colours
N121.4MLY	LANmark-OF Pigtail LC/UPC Singlemode Maxistrip LSZH 9/125 1m Yellow
N121.4MPY	LANmark-OF Pigtail LC/APC Singlemode Maxistrip LSZH 9/125 1m Yellow

(*): Aginode recommend using the set of 12 pigtails with different colours. The colours match fibre colours according to TIA/EIA-598-B (Blue, Orange, Green, Brown, Grey, White, Red, Black, Yellow, Violet, Pink and Aqua)



Installation phase 1 - Preparation of the patch panel

1.1 Related documents

The General "Installation Guide for Optical Fibre Cable" document provides information related to key topics that need to be followed during installation.

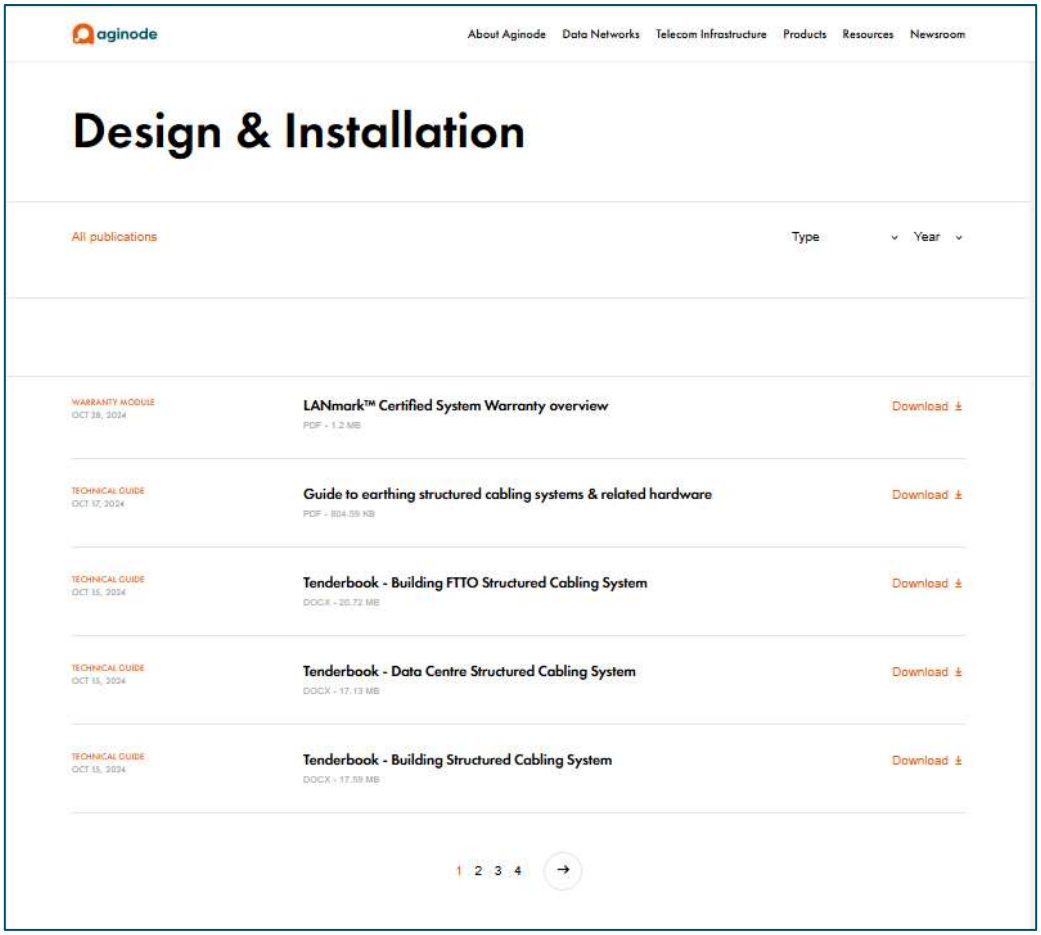
The following guides provide more detailed information on handling requirements for specific cable types:

- Tight Buffer Cable Supplement
- Loose Tube Cable Supplement
- Micro-Bundle Cable Supplement
- Pre-Terminated Cable Supplement

In addition, there is also a General Installation Guide (for both copper and fibre) which includes further information.

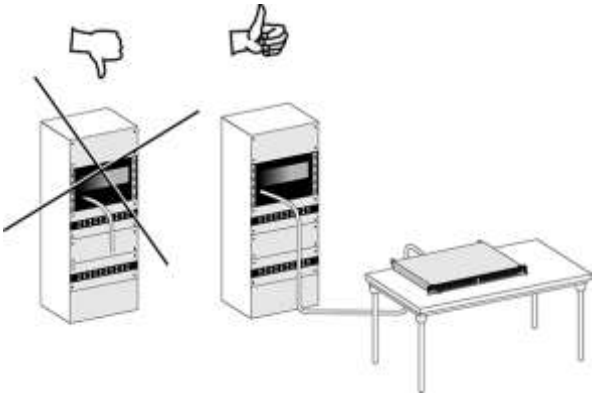
Please note: The Aginode warranty may be invalidated if the cables have not been properly stored or handled according to Aginode requirements.

When logged into the AGINODE site, all these documents and also others relating to design and installation testing etc can be found here



1.2 Installing the cable

Ensure a length of spare cable (slack) is provided within the cabinet (4 or 6 m recommended – rear or front termination). As well as being required to facilitate the termination of the cable in the OF patch panel, spare cable will allow the ability to relocate the panel if required in the future.



NB1. Spare cable may require special stowage requirements in the installation.

NB2. When using fusion splicing, always cut off the first meter of cable as this part can be damaged after pulling the cable, bending etc.... The removal of this 1m section should be taken into consideration in respect to the final amount of cable slack provided.

1.3 Installing the patch panel into the cabinet

1. The L shaped chassis support brackets can be fitted in 5 different positions. To do so, remove the 4 screws (A). The location of the screws varies according to the position of the bracket (i.e. B – see next page)

   By default, the brackets are installed in the second forward position (2)

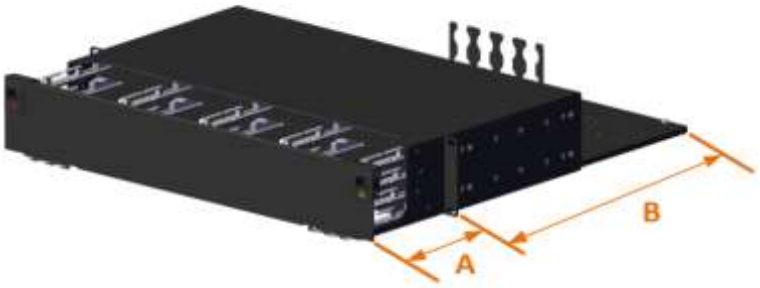
   They can be moved to the forward position (1) if the front space is limited in the rack or moved to one of the three most recessed positions (3, 4 or 5) if needed.

   Important note: We do not recommend to use the position 1 as it will make it very difficult to depress the tray locks of the trays

The “right” position is dependent on the available space between the 19” frame and the cabinet door and/or on the depth of the rack.

Depth info, in front of the rack post and recessed from the rack post, for each position:

Position	In front of rack post (A)	Recessed from rack post (B)
1	9,15 cm	43,45 cm
2	12,90 cm	39,70 cm
3	14,15 cm	38,45 cm
4	16,65 cm	35,95 cm
5	20,35 cm	32,25 cm

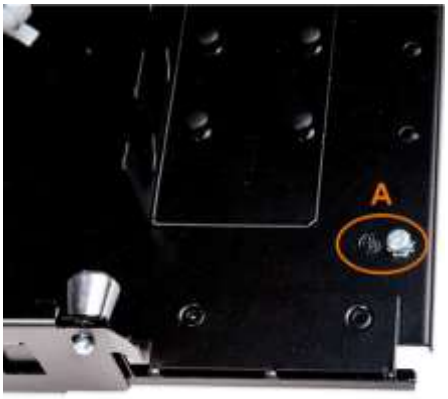


2. Position the patch panel into the rack.

   Remember to complete bonding requirements for metallic items using a suitable bonding conductor (min. 2.5 mm sq) and the screw / washer provided on the chassis (A).

   NB. The holes for the screw are located at the rear of the panel on the left and right hand sides of the chassis, but the screw is located at the left hand (see phase 3).

   Thread the Pre-Term or cable through the chassis of the patch panel (front termination).
   Make sure to comply with the cable's minimum bending radius while handling the cable.



1.4 Termination from the front or from the rear side

The installation of the modules can be performed from the front side or from the rear side of the patch panel.
We recommend performing the initial installation from the rear side as it will ease the process (see picture).
Installation from the front side is mainly dedicated to the changes required after day one when the access to the rear side is not possible or not desirable anymore.
If the initial installation is performed from the front, access to the rear side is nevertheless required to fix the cables and their glands in the supports provided for that end and to dress the split bundles so ensuring a correct guidance of the fibres to the modules installed on the trays.
For front installation only, thread the pre-terminated assembly or the cable through the chassis of the patch panel.

Make sure to comply with the cable's minimum bending radius while handling the cable.

Phase 2A - Termination with LC pre-terminated assemblies

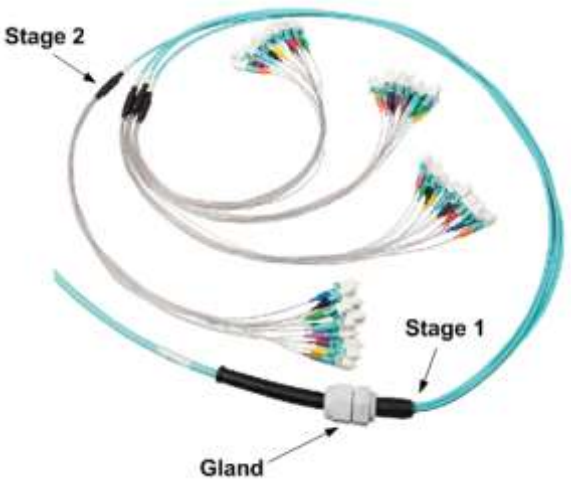
For pre-terminated OF cable general pulling rules and pulling accessory removal procedure, please refer to the Aginode FO installation guide and pre-terminated cable supplement. These documents can be viewed when logged into the AGINODE website (see page 17).

Installation process in the LC adaptor module

The 900µ m fan-out of the pre-terminated assembly is made in two stages:

1. Split in bundles/legs of 12 fibres
2. Split in 12x 900µm single fibres

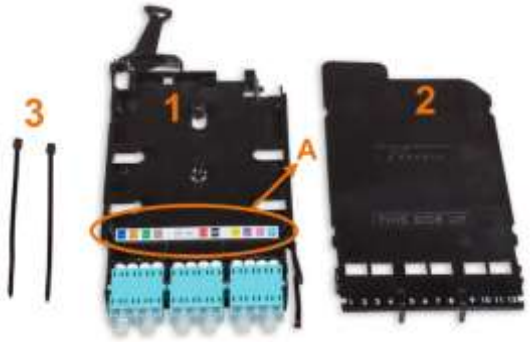
The LC adaptor modules are available separately (see page 9).



Important note
We recommend first installing all legs of the pre-terminated assembly in their respective modules before proceeding to the installation of the modules into the patch panel.

1. Select the correct module depending on the type of fibre (MM or SM) and connector ferrule polishing (PC or APC).

   The module contains two parts: the base (1) and the cover (2).
   The colour code to be used when connecting the connectors to the adaptors is indicated on the label located inside the base (A).
   The module is supplied with 2x tie wraps (3).



2. Select the leg to be terminated. A label (B) is located on every leg at the rear of the fanout.

Note: Corresponding legs have the same number on both ends of the cable (see Annex B and C).

3. Slide the two cable ties into the openings present at the rear side of the base of the module and lay down the fanout leg on the base as indicated on the picture.

4. Secure the leg onto the base at the back of the module by means of the two tie-wraps. Cable ties shall not deform the fanout –ties should be hand tight.

   Before cutting the tails of the cable ties turn down the head of the cable ties to ensure it will not prevent the cover of the module to be correctly fixed.

5. Remove the protection caps on the inside of the adaptors where connectors will be inserted.

6. Untangle the fibres to allow easy dressing inside the module.

7. Coil the fibres on the base using the retention tabs (A) provided and insert connectors into the adaptors according to the colour coding sequence. The result should be as indicated on the next pictures.

8. Insert the 12 connectors into the adaptors.
   The colour of the boot of the connectors has to match the colour indicated on the label located on the base in front of the adaptors.

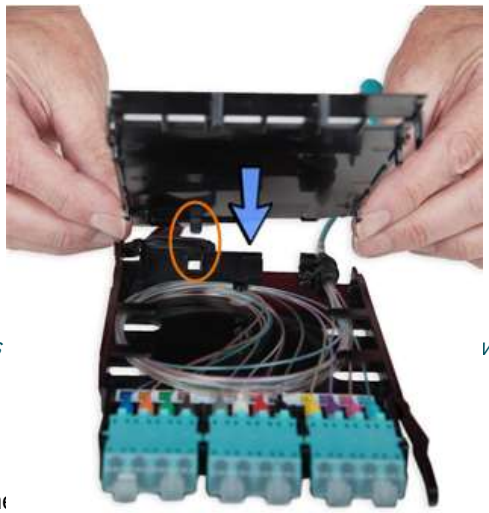
Important note: remove the protection cap off the connector one by one just before connection.

A check for the cleanliness of the adaptors and connectors is required prior to the insertion of the connectors – see Important note below.

<u>Important note – OF polarity has to be maintained</u>
The connectors of the 900 µm pre-terminated assemblies have coloured boots as shown on the pictures.
The insertion has to be realised according to the colour coding sequence of the boots and NOT according to the colour of the fibres.
Because of the OF polarity, the colours of the boots are swapped over at one end of the pre-terminated assembly to facilitate error free implementation of the required fibre pair-flip.

Also see Annex B – OF polarity

9. To install the cover onto the module first position the rear of the cover at the cable entry of the base.
10. To ensure correct alignment of the two parts engage the central tab of the cover into the slot of the base as illustrated on the picture.



Note: Control the correct position of the fibres when the cover is locked down.

11. Lower the cover down to the base. First lock the rear tabs. Align the side and front tabs of the cover with the slots of the base and complete the locking of the cover.

The installation of the LC module is completed. Repeat the process for every fanout leg of the pre-terminated assembly.

Important note

The cleaning of all the optical fibre connectors prior to the installation (pigtail, patch cords etc) is a critical factor that needs to be applied at all times.

Latest applications have stringent link loss requirements and in order to ensure that the required performance levels are achieved during commissioning and operation, the cleanliness of all fibre interfaces needs to be maintained.

See Annex A

Go to page 39 to continue the installation process:

Phase 3: installation of the modules in the ENSPACE UHD patch panel.

Phase 2B - Termination with MTP pre-terminated assemblies in MTP modules

For pre-terminated OF cable general pulling rules and pulling accessory removal procedure, please refer to the Aginode FO installation guide and pre-terminated cable supplement. These documents can be viewed when logged into the AGINODE website (see page 17).

MTP pre-terminated assemblies can be either

- directly terminated into MTP modules loaded with MTP adaptors
- connected to the MTP adaptor located at the back of MTP/LC modules (see phase 2C)

Installation process in the MTP module

The 2mm fan-out legs of the pre-terminated assembly shall be directly terminated inside the MTP adaptor modules.

The MTP adaptor modules are available separately (see page 10).

Important note
We recommend first installing all legs of the pre-terminated assembly in their respective modules before proceeding to the installation of the modules into the patch panel.

1. Select the correct module depending on the type of fibre (MM or SM) the number of MTP adaptors (2, 4 or 6) and connector polishing (PC or APC).

   The module contains two parts: the base and the cover.
   A numbering label for the MTP adaptors is located inside the base.

2. Select the legs to be terminated. A label is located on every leg at the rear of the boot of the connector.

Note: Corresponding legs have the same number on both ends of the cable (see Annex B and C)

The rear side of the base of the module is equipped with a strain relief support having three slots to hold in place 3x 2 MTP legs as indicated on the picture (A).

3. Untangle the legs to allow easy dressing inside the module.

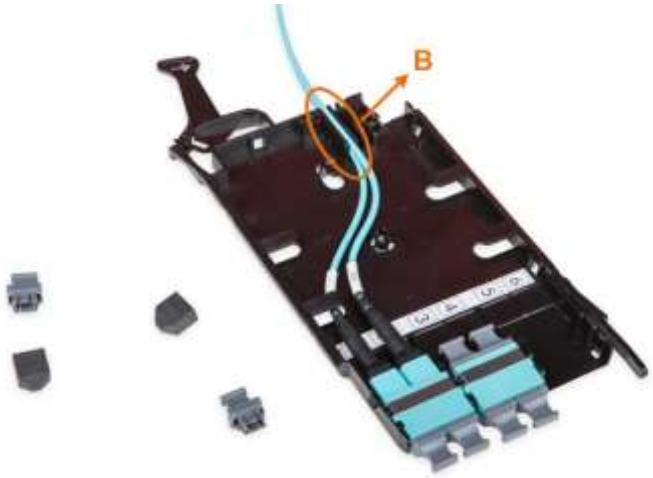
4. Remove the protection caps on the inside of the adaptors where connectors will be inserted.

5. Remove the protection cap off the MTP connector and Insert it into the adaptor according to the numbering sequence.

Important note: the face of the plug has not been cleaned at this point. This can be done at a later stage. It must be done before a plug is inserted into the front of the adaptor.

6. Align the cable with the slot of the support and gently pushed it inside.

The two MTP terminated legs to be connected to the same dual MTP adaptor have to be inserted into the same slot of the support (B).



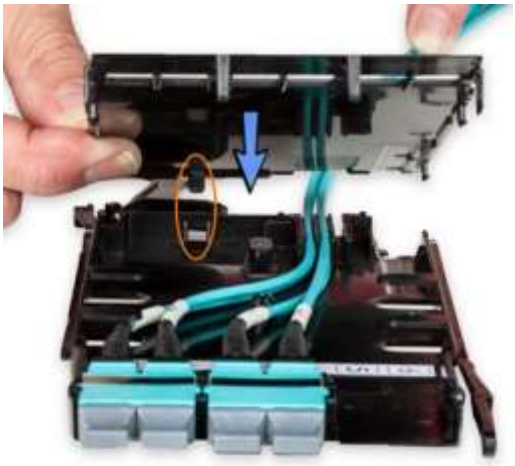
7. Repeat the process for the 2, 4 or 6 MTP legs depending on the type of module.

Important note: remove the protection cap off the connector one by one just before connection.

A check for the cleanliness of the adaptors and connectors is required prior to the insertion of the connectors – see Important Note below.

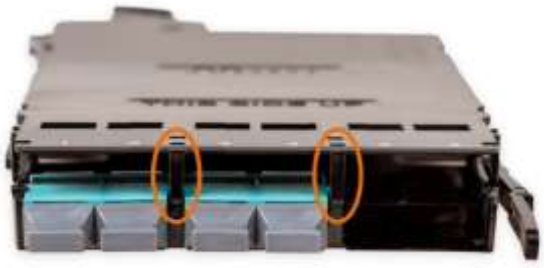
8. To install the cover onto the module first position the rear of the cover at the cable entry of the base.
   To ensure correct alignment of the two parts engage the central clip of the cover into the slot of the base as illustrated on the picture.

   Note: Control the correct position of the fibres to ensure that they will not be trapped when the cover is locked down



9. Lower the cover down to the base. First lock the rear tabs.

10. Align the side and front tabs of the cover with the slots of the base and complete the locking of the cover.



The installation of the MTP adaptor module is completed. Repeat the process for every legs of the pre-terminated assembly.

Important note

The cleaning of all the optical fibre connectors prior to the installation (pigtail, patch cords etc) is a critical factor that needs to be applied at all times.

Latest applications have stringent link loss requirements and in order to ensure that the required performance levels are achieved during commissioning and operation, the cleanliness of all fibre interfaces needs to be maintained.

See Annex A

Go to page 39 to continue the installation process:

Phase 3: installation of the modules in the ENSPACE UHD patch panel.

Phase 2C - Termination with MTP pre-terminated assemblies in MTP/LC modules

For pre-terminated OF cable general pulling rules and pulling accessory removal procedure, please refer to the Aginode FO installation guide and pre-terminated cable supplement. These documents can be viewed when logged into the AGINODE website (see page 17).

MTP pre-terminated assemblies can be either

- directly terminated into MTP modules equipped with MTP adaptors (see phase 2B)
- connected to the MTP adaptor located at the back of MTP/LC modules

Installation process on the MTP/LC module

The 2mm fan-out legs of the pre-terminated assembly shall be directly connected to the MTP adaptor located at the back of MTP/LC modules.

The MTP/LC modules are available separately (see page 11).

Important note
We recommend first installing all legs of the pre-terminated assembly on their respective modules before proceeding to the installation of the modules into the patch panel.

1. Select the correct module depending on the type of fibre (MM or SM) and connector polishing (PC or APC).

   Important note
   The MTP/LC module is sealed and should never been opened. The warranty becomes void if the seal is broken.

2. Remove the protection caps off the MTP adaptors of the module and off the MTP connector of the MTP leg.

3. Check for the cleanliness of the MTP connector and connect it into the adaptor of the module according to the numbering sequence.

Important note: remove the protection cap off the connector one by one just before connection. The face of the two MTP connectors (preterm + module) must be inspected and cleaned before insertion.

4. Repeat the process for all the legs of the pre-terminated assembly.

A check for the cleanliness of the adaptors and connectors is required prior to the insertion of the connectors – see Important Note below.

Important note

The cleaning of all the optical fibre connectors prior to the installation (pigtail, patch cords etc) is a critical factor that needs to be applied at all times.

Latest applications have stringent link loss requirements and in order to ensure that the required performance levels are achieved during commissioning and operation, the cleanliness of all fibre interfaces needs to be maintained.

See Annex A

Go to page 39 to continue the installation process:

Phase 3: installation of the modules in the ENSPACE UHD patch panel.

Phase 2D – Pigtail splicing in LC modules

LC adaptor modules can be loaded with a splice holder to allow pigtail splicing.
LC modules are supplied with two splice holders: the first one being suitable for heat shrink splice protection and the other one for Aluminium splice protection.
Splice holders can be loaded with 12 heat shrinkable or 12 Aluminium splice protections.

Note: When working with the holder for heat shrinkable splice protection 2 protected splices have to be installed on top of each other in every of the 6 available locations.

Important note

The available space dedicated to the storage of the fibres being reduced in the modules Aginode mandate the use of maxi-strip pigtails. Tight Buffer pigtails shall not be selected.

For the same reason only cable structures containing 250µm coated fibres shall be used (Loose Tube or Micro-Bundle structures). Tight Buffer (TB) cable structure containing 900µm fibres shall not be selected.

Construction of the fanouts of the Micro-Bundle (MB) cables

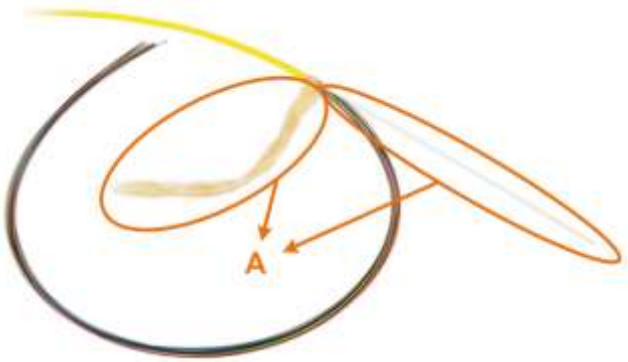
Micro-Bundle cables contain bundles of 12 fibres. During onsite termination, each bundle shall be terminated in a 12 LC adaptor module.
Therefore it is required to fix the end of the cable on the patch panel using a gland and to protect the fibres all along their path to the modules.

The cable glands are available separately (see page 13).

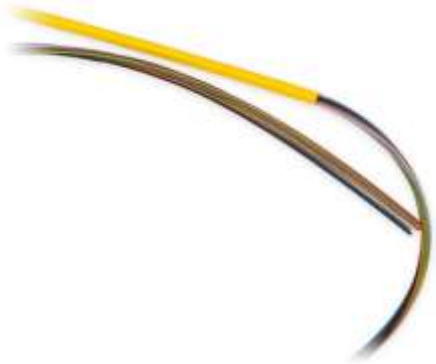
1. Slip a cable gland on the end of the cable.

2. Remove approximately 1.5 m of the jacket.

   We recommend removing lengths of maximum 30 cm – Repeat the process 5 times.



3. Cut the internal elements as shown on the pictures (A).



Notes

- *The detailed cable jacket removal process is described in the MB cable supplement of the Aginode OF fibre installation guide (see page 17).*
- *Recommended tools and accessories: see page 15*

4. Cut 2, 4 or 8 pieces of protection tube according to the number of bundles contained into the cable (24, 48 or 96 fibres). The length of the protection tubes shall be 900 mm.

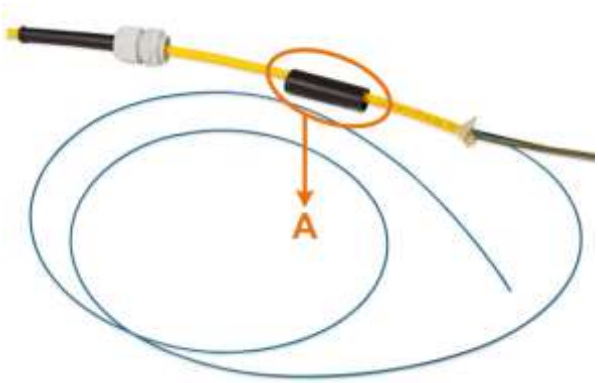
   The protection tube is available separately (see page 13)
   Select the colour of the tube according to the type of fibre:
   - Aqua, violet or lime green tube for Multimode fibre OM3, OM4 or OM5
   - Yellow tube for singlemode fibre.

5. In order to differentiate the bundles from each other it is required to label every protection tube. A label (1 to 8) shall be applied at the end of the tube (these labels are not provided by Aginode)

Colour code of the micro-bundles

Bundle	Colour
1	Blue
2	Orange
3	Green
4	Brown
5	Grey
6	White
7	Red
8	Black

6. Slip a piece of 50 mm of heat shrinkable sleeve (A) on the end of the cable (see page 14).



7. Insert a micro-bundle into one of the lengths of protection tube.

When the micro-bundle emerges out of the far end of the tube carefully pull it out whilst sliding the tube to butt up against the jacket of the cable.

8. Strip the micro-bundle of the first group of fibres on its entire length, from the end of the protection tube (A), according to the procedure described in the Micro-Bundle supplement to the OF installation guide (See page 17).

Notes

- *We recommend stripping length of maximum 200 mm*
- *Repeat the process until the entire length of micro-bundle is removed*
- *A remaining length of 10 to 15 mm of micro-bundle is acceptable*
- *Insert the micro-bundle into the position 20AWG / .80mm of the stripping tool*

9. The fibres shall now be carefully cleaned using an appropriate degreaser (see page 15) before termination.

   Repeat the cleaning process for each fibre until they are all perfectly clean.

10. Repeat the process from step 7 for every bundle.

11. When the process is completed for every bundle slide the adhesive heat shrinkable sleeve back until it is covering the joint between the cable and the protection tubes and neatly heat shrink the sleeve around the cable and the protection tubes.

12. Unscrew the gland and slide it forward until it abuts the sleeve and tighten the gland in this position. The fanout is now ready to be terminated in the modules.

Termination of the fibres into the LC modules

Important note

We recommend first installing all legs of the pre-terminated assembly in their respective modules before proceeding to the installation of the modules into the patch panel.

1. Select the correct module depending on the type of fibre (MM or SM) and connector polishing (PC or APC).

   The module contains two parts: the base and the cover. The colour code to be used when connecting the connectors to the adaptors is indicated on the label located inside the base.

2. Select the correct splice holder (See page 31) and install it on the base of the module.

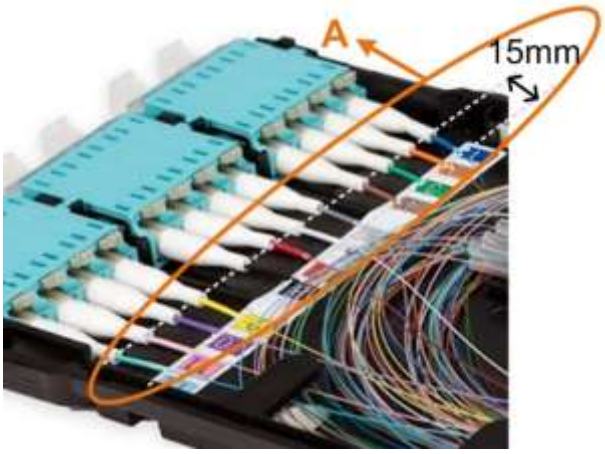
3. Secure the outer jacket of the cable onto the base at the back of the patch panel by means of the two tie-wraps. Cable ties shall not deform the jacket – cable ties should be hand tight.

   Before cutting the tails of the cable ties turn down the head of the cable ties to ensure it will not prevent the cover of the module to be correctly fixed.

4. Strip the 900µm coating of the Maxistrip pigtails on its entire length only leaving a maximum of 15mm of secondary coating as shown on the picture (A)

5. Remove the protection caps on the inside of the adaptors where connectors will be inserted.
   A check for the cleanliness of the adaptors and connectors is required prior to the insertion of the connectors.

Notes



6. Insert the 12 connectors into the adaptors according to the colour coding sequence.

Important note: remove the protection cap off the connector one by one just before connection.

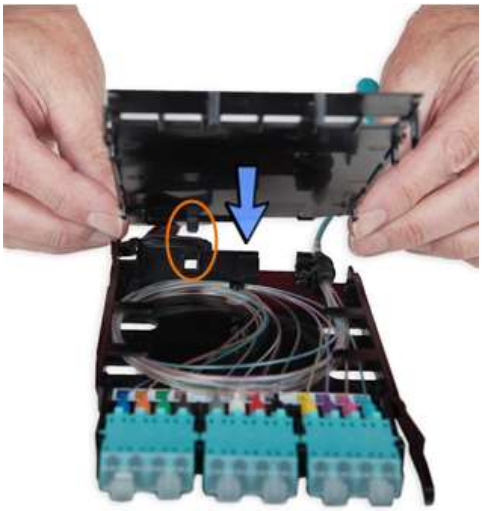
7. Cut the fibres of the cable to the right length, slide the heat shrink protections tubes onto the fibres and joint them by fusion splicing with pigtails following the correct colour sequence.

   Note
   - The fibres from the cable should make 2 loops in the module

   On one end of the link fibres shall be pair flipped (see Annex B). The "Recommendations to maintain duplex OF channel polarity" technical paper, which is available from our AGINODE website (under the File Library) should be considered when choosing the colour order.

8. Secure the splice protection into the splice holder and dress the fibres inside the module
   As highlighted on the first picture, two heat shrink protected splices shall be installed on top of each other in each of the 2x 6 splice holders of the cassette to accommodate 12 splices on a single module.

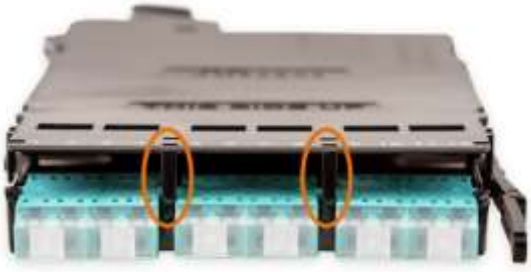
9. To install the cover onto the module first position the rear of the cover at the cable entry of the base.



To ensure correct alignment of the two parts engage the central clip of the cover into the slot of the base as illustrated on the picture.

Note: Control the position of the fibres to ensure that they will not be trapped when the cover is locked down.

10. Lower the cover down to the base. First lock the rear tabs. Align the side and front clips of the cover with the slots of the base and complete the locking of the cover.



The installation of the LC module is completed.

Repeat the process for every leg of the assembly.

Important note

The cleaning of all the optical fibre connectors prior to the installation (pigtail, patch cords etc) is a critical factor that needs to be applied at all times.

Latest applications have stringent link loss requirements and in order to ensure that the required performance levels are achieved during commissioning and operation, the cleanliness of all fibre interfaces needs to be maintained.

See Annex A

Go to page 39 to continue the installation process:

Phase 3: installation of the modules in the ENSPACE UHD patch panel.

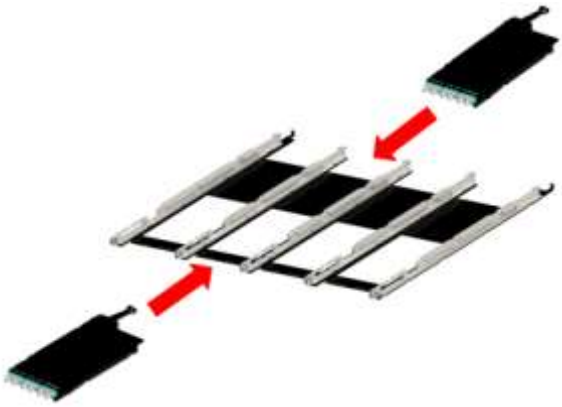
Phase 3 – Installation of the modules inside the patch panel

The following procedure is valid for every type of ENSPACE module.

The modules shall have been prepared and assembled according to the instructions provided in the former chapters.

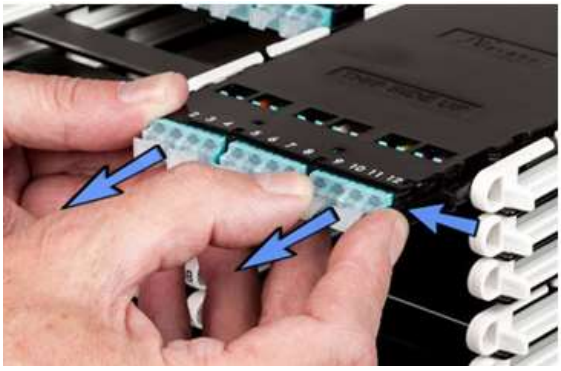
Important notes

1. ***The modules can be installed on the sliding trays from the front side or from the rear side.***
   Gently slide the module onto the tray between two brackets until it locks

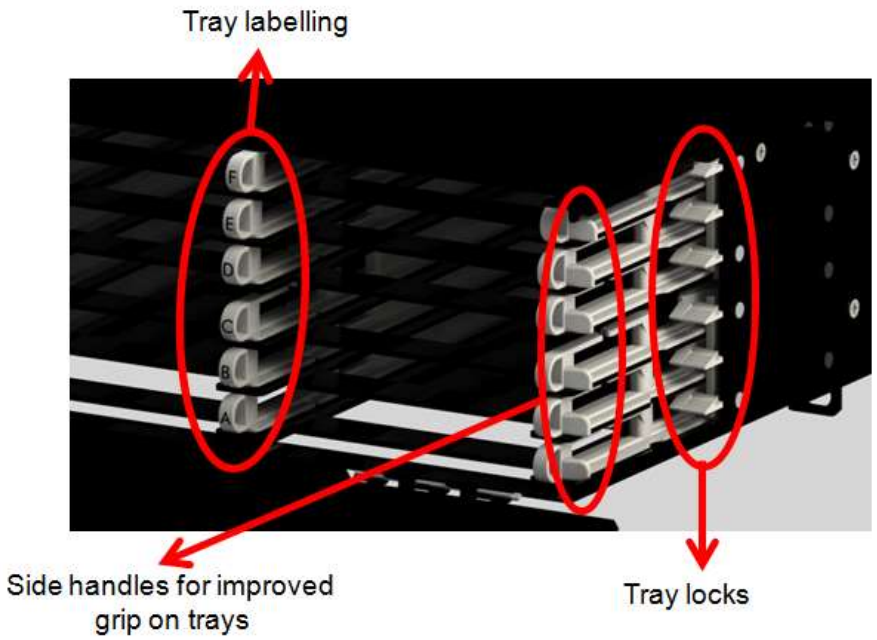


2. ***To remove a module from the rear side of the panel depress the rear tab to unlock the module and pull on the tab to remove the module.***
   First ensure that no patch cords are connected to the front of the module

3. ***To remove a module from the front of the panel depress the front tab to unlock the module and pull the module out of the tray.***
   First ensure that no cable is connected at the back of the module or at least ensure that enough cable slack is available to pull the module from the front.



1. ***Tray labelling is located at the front of the fibre management bars.***
   Labelling scheme: upwards from A to C (1U), A to F (2U) and A to M (4U)



2U ENSPACE UHD panel

1U ENSPACE UHD panel

4U ENSPACE UHD panel

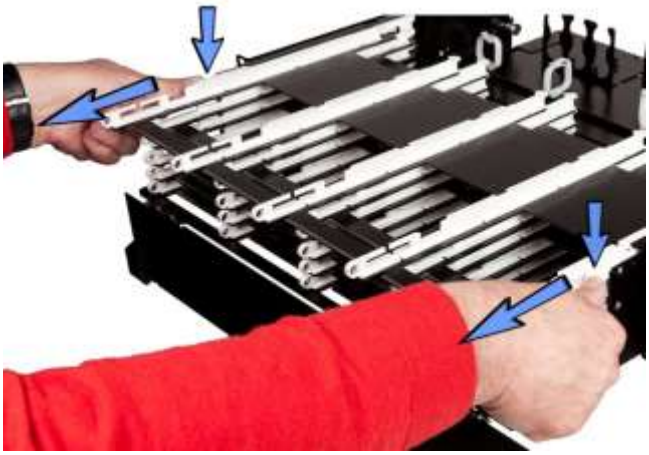
2. Trays can be moved in and out on 3 different locking position:

A. Operational position inside the panel
B. Patching position to gain easy access to the connectors of the cords
C. Final stop position before removal of the tray

Never pull out a tray loaded with connected modules further than the patching position.
Should it be needed to pull the tray further, more cable slack shall be provided at the rear.

3. Use the side handles located on both sides of the trays to pull a tray out of the panel from the operational position to the patching position (also see first picture of the page 39)

1. ***To unlock a tray depress the tray locks located on both sides of the tray while pulling it out (also see first picture of the page 39). The lock feature is only operational when moving the tray out of the panel from the patching position or from the final stop position.***

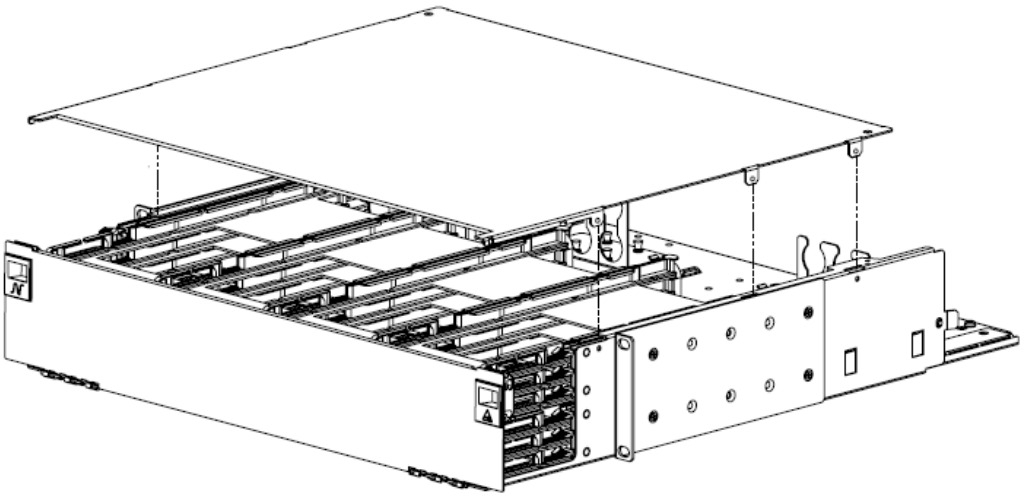


2. ***To remove a tray, depress the tray locks to unlock it from the position 3 and pull until it comes out of the panel.***

3. ***To install a tray engage it inside the panel between two brackets and slide it in until it reaches the required position. There is no need to unlock the tray when pushing it back inside the panel.***

4. ***The cover of the panel is not screwed to the chassis.***
   To remove the cover just pull it upward.

5. ***To install the cover align the back tabs located on each side with the corresponding slots of the chassis and gently lower it down ensuring the other tabs are correctly aligned with the slots until it locks. Check if the tabs are correctly engaged on each side of the cover.***



6. ***To open the front lid of the panel push down the two locks and pull to open.***

Installation process

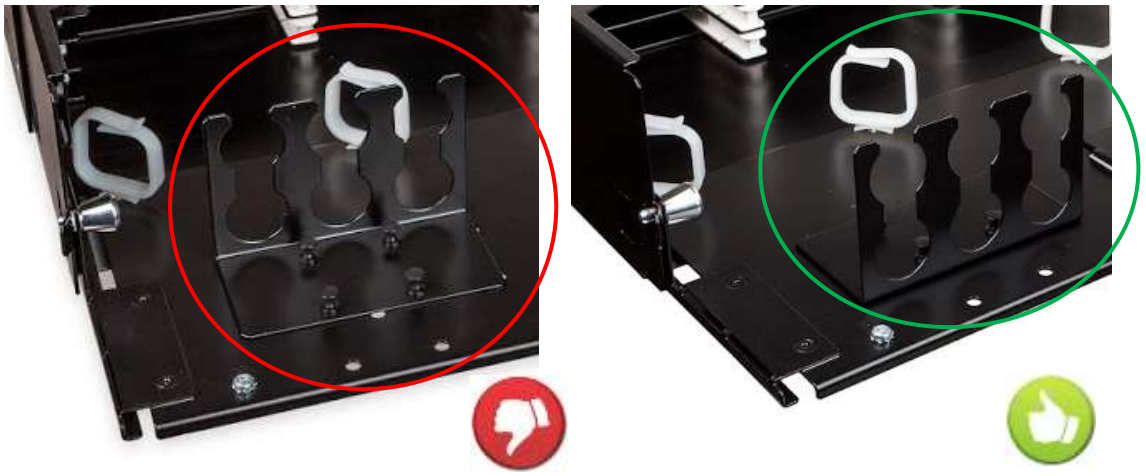
The following process is related to the installation of the modules in a 2HU ENSPACE UHD patch panel. The procedure is also valid for the 1HU and 4HU ENSPACE UHD patch panels.

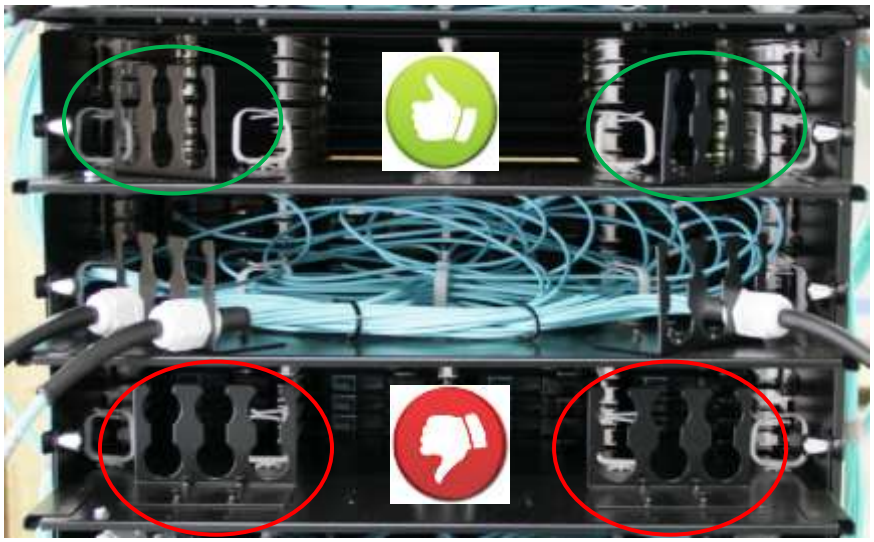
As previously stated we recommend

- first *installing all legs* of the assembly in their respective modules before proceeding to the installation of the modules into the patch panel (see phases 2A, 2B, 2C and 2D)
- Install the modules from the rear side of the panel

The panel shall have been first installed in the rack (see phase 1)

Important note: By default the 2 glands supports are installed in their parking position (red circles). Both supports shall be turned in the opposite direction even for the ones not in use (Green circle).





1. Pull on the two side locks located on either side of the panel to unlock the rear drawer and slide it back until it is tilted down

Note: When the rear drawer is in its back and tilted position the three lower trays (from the six pieces contained in a 2U panel) can temporarily be slid further back inside the panel beyond their operational position to ease the installation of the module (also see page 47).

2. To unlock a gland support, pull up its 4 locks. Pull the support out and position it in the required position depending on the location of the cable at the back of the rack (see important note on the next page).
When the support is correctly installed push the 4 locks down.

Important notes

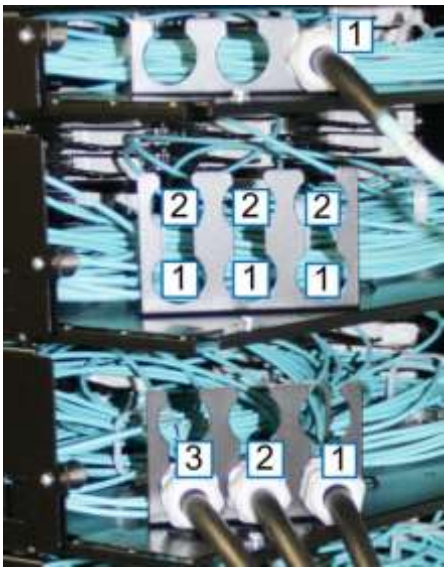
- ***Gland supports can be installed in three different positions (parallel, perpendicular or 45° angled). Select the correct position depending on the depth of the rack and on the location and path of the cables inside the rack.***

- ***We recommend installing the supports in use in the 45° angled position as shown on the picture.***

- ***Whenever possible we recommend installing all the cables on the same side and in a single gland (lower rows) support.***

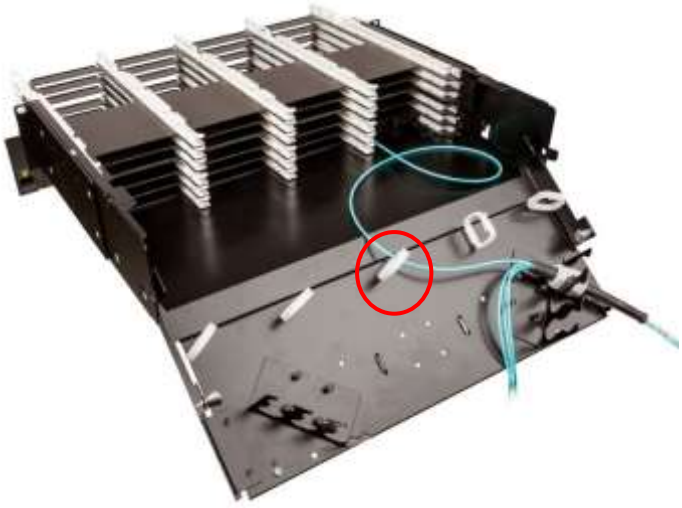
- ***Removing the cover of the panel is not required. On the pictures it is removed to clearly show the process.***

3. Slide and fasten the gland in one of the gland holes.
   We recommend to first use the inner position (1).
   For support having two rows of 3 holes (2U and 4U panels) first use the lower row according to the sequence shown on the picture.



4. Select the first module (see the label of the leg associated with the modules)

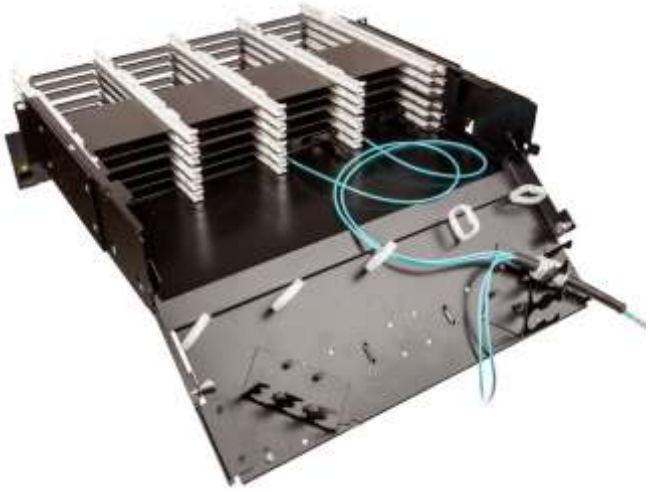
5. Create a loop with the cable and slide the first module into the lower tray. The cable has to be installed inside the central loop ring (red circle) only.
   All the legs of the group are going to be inserted into another loop ring at a later stage (see page 52).



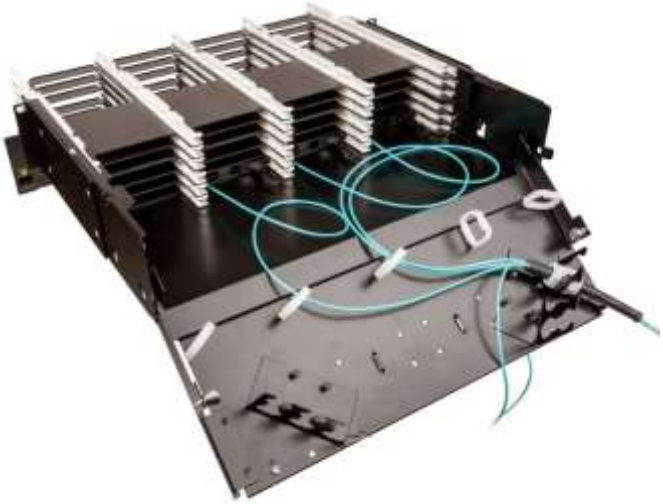
Notes

- *When the rear drawer is in its back and tilted position the three lower trays (from the six pieces contained in a 2U panel) can temporarily be slid further back inside the panel beyond their operational position to ease the installation of the module (see picture on page 45).*
- *For a 1U panel, all trays can be temporarily slid further back.*
- *For a 4U panel as there are two rear drawers each serving one group of 6 trays the first note is valid for both groups of 6 trays.*
- *Do not forget to push back the tray in their operational position before sliding back the rear drawer in its operational position or else the trays will prevent the rear drawer to reach its operational position.*

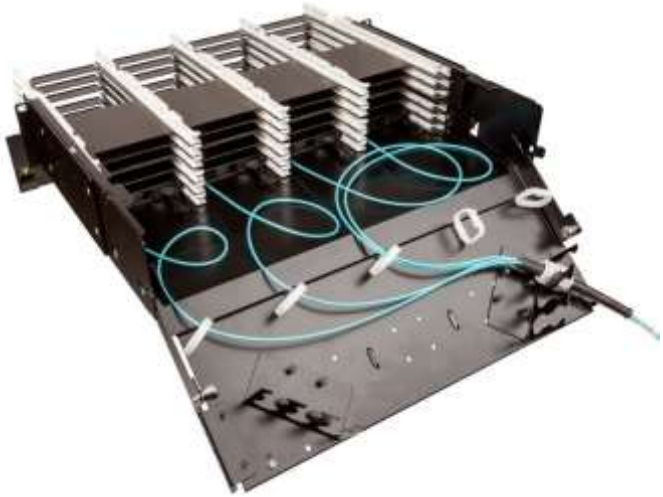
6. Install the second, third and fourth modules onto the first tray.



7. For each create a loop with the cable and slide the module into the lower tray. The loop of cable is always first lying inside the loop ring at the left side but temporary remains out the other loop rings. On the first tray the next loop is always installed on top of the former one if required.

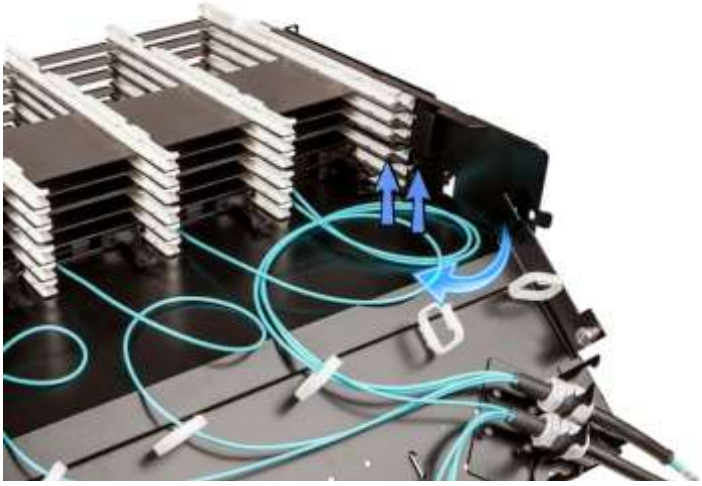


Important note: The position of the cables/legs shall be maintained to ensure a smooth movement of the fibres when pulling the trays into their patching position and back to their operational position.



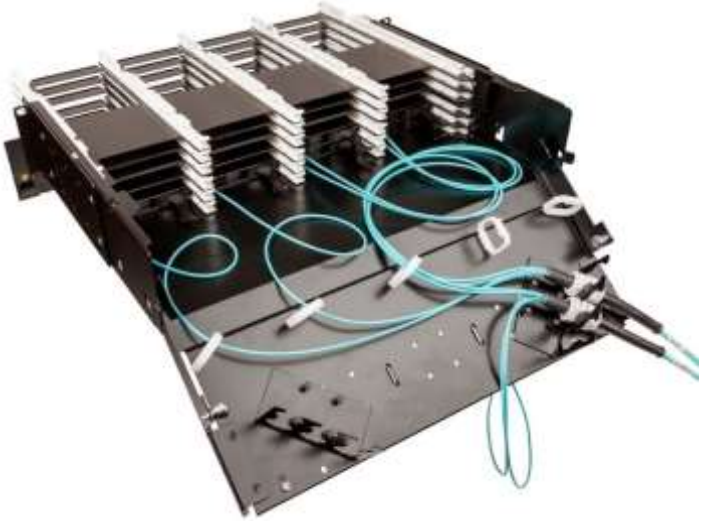
8. If needed prepare and install another assembly.

9. Continue with the installation of the first module on the second tray.



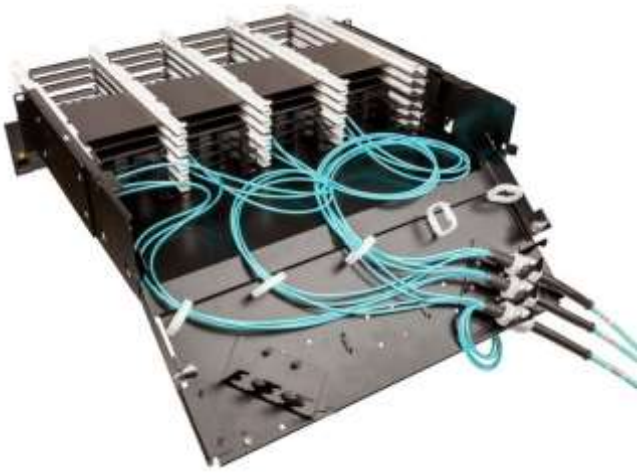
Important note: The loop of the cable shall be laid under the loop of the first tray as indicated on the picture – First lift up the second loop of the first tray

10. Repeat the process with the next modules and always lay down the cable loop below the one of the first level before sliding the module onto the tray.



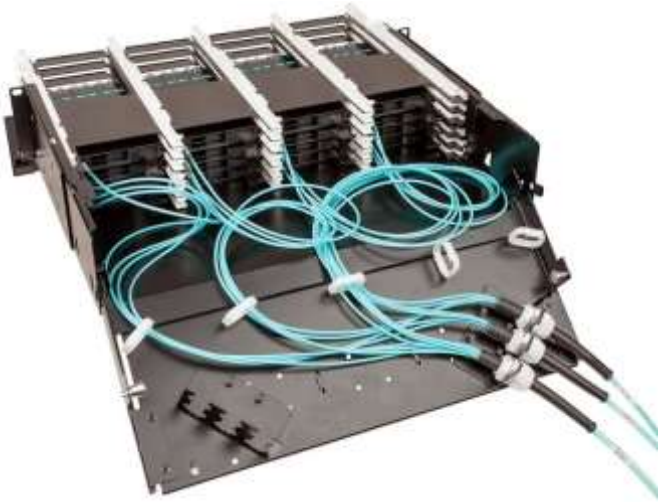
Important note: Never install the loops on top of each other, the risk being to block the movement of the cable when pulling one tray back and forth.

11. Continue with the installation of the second (next) assembly. Repeat the procedure from step 4.



12. For 1U panel when the installation of the modules on the three trays is completed go to step 15 to complete the installation.

13. For 2U and 4U panel continue the process. Always repeat the process from the step 4.



Reminder - Important note: The loop of the cable shall be laid under the next group of loops as indicated on the picture – First lift up the second group of loops as shown.

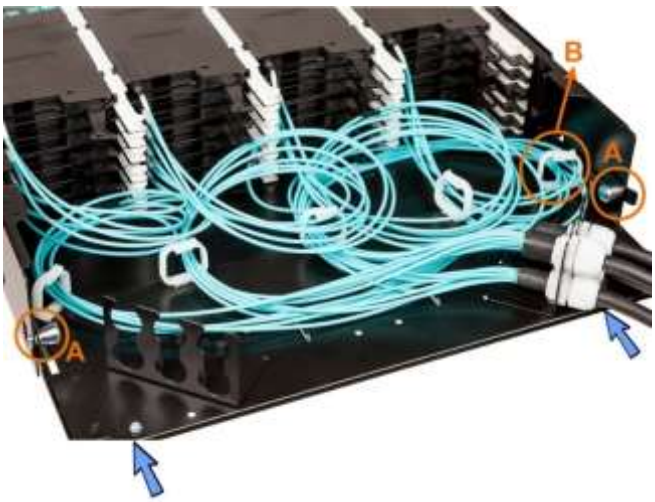
14. Proceed to the installation of the next assemblies. Always repeat the process from the step 4.

Reminder - Important note: The loop of the cable shall be laid under the next group of loops as indicated on the picture – First lift up the next group of loops as shown.

The installation of the modules is completed when the 6 trays are filled up.

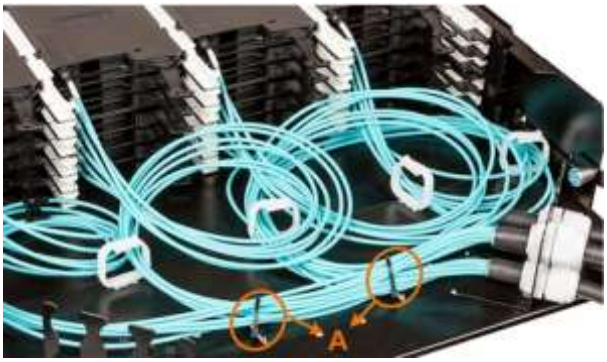
15. Gently slide the rear drawer back in its operational position and lock it using the two side locks (A)

16. Put the legs of the first column of modules inside the first loop ring (B).



17. Secure the legs onto the back of the rear drawer by tie-wraps (A) (Not provided)

Note: To have a tidy dressing of the cables you may wish to put all the ends of the legs inside the loop rings but we recommend leaving it free to ease the movement when pulling the trays out of the panel.

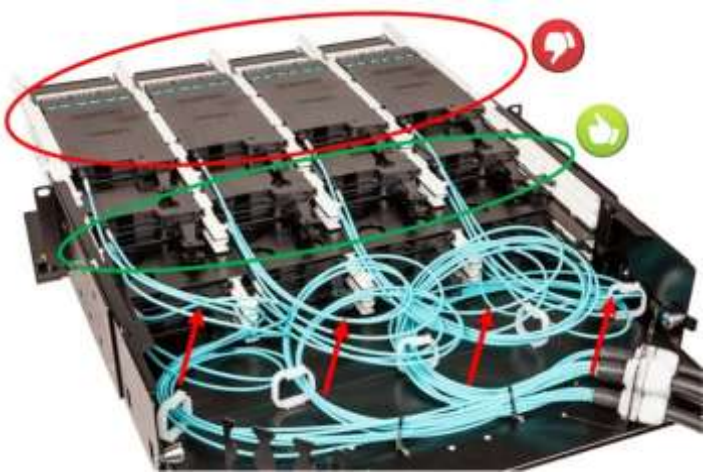


18. Pull out each tray one by one to the patching position and push it back in the operational position to control the correct movement of the legs. Re-arrange the loops in a better way if legs are not freely moving back and forth.

Important note: Pulling the trays out of the panel further than the patching position to reach the final stop position is not recommended once the modules are installed as

- ***it is going to create tighter bending radius that can affect the performance of the fibres***
- ***Excess tension will release the cable tidy loops. In this case the legs are not going to move back in their default position when the tray will be pushed back in its operational position.***

Should it be needed to work on a module it has to be slid out from the rear of the panel.



The 4U panel is made up of an assembly of 2x 2U panels. Therefore the process shall be repeated from step 1 to install the modules on the second group of 6 trays.

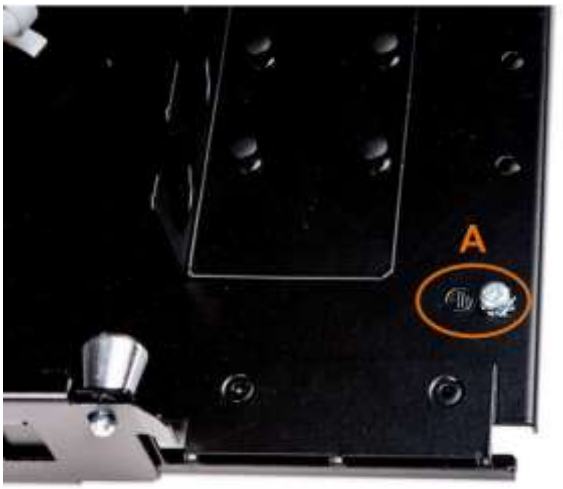
Phase 4 – Finalisation of the installation

Port labelling can be achieved by using the included labelling system.
The port label can be removed from the panels front cover by sliding it over either of the cover retaining latches, so the label can be easily marked by hand or using a printer.
Once marked the label can be reassembled to the rear of the front cover by sliding it over the retaining latch and under the covers hem features.
Alternatively the label can be marked and attached to either the front or rear of the panel cover with adhesive, by removal of the labels backing sheet.

Custom labels can also be stuck on either side of the front cover of the patch panel.
Label according to today´s network administration standards.
Label the ports conforming with the site labelling scheme.
Picture is provided only for illustration.

The ENSPACE UHD panel is not equipped with any automatic bonding feature.
Therefore, a bonding connection has to be made to the chassis using a bonding conductor (A) - 2.5 sq mm recommended.

Spare / slack cable should then be appropriately secured depending on the installation requirements of the site.



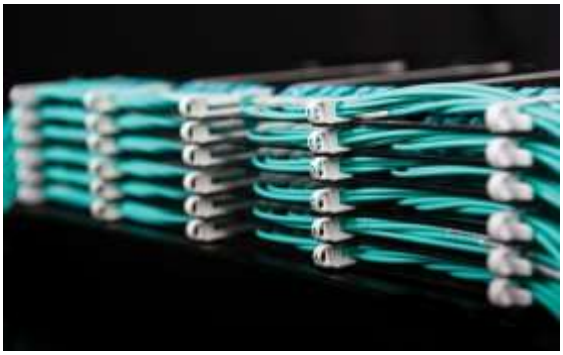
The patch panel installation is now complete. Testing must be carried out in accordance with client requirements and Aginode requirements for warranty submission.

Patch cords can now be installed.
On completion the installation must be handed over to the customer with all dust caps fitted to
unpatched adaptors.

Any dust caps that have been removed must be stored appropriately for potential re-use.

Optical Power / Safety levels warning labelling and security procedures must have been implemented on completion of the installation.

An example is where the optical hazard requires identification labels to be fitted and security procedures for racks and doors to be fitted and closed/ locked.



Annex A

INSPECTION, CLEANING & TESTING

The cleaning of all optical fibre connectors prior to the installation (pigtail, patch cords etc) is a critical factor that needs to be applied at all times.

Latest applications have stringent link loss requirements and in order to ensure that the required performance levels are achieved during commissioning and operation, the cleanliness of all fibre interfaces needs to be maintained.

The Aginode **OF connector Inspection, Cleaning & Testing general guidelines** can be downloaded from the Aginode website.

In addition, there is also a General Installation guide (for both copper and fibre) which includes further information.

Please note: The Aginode warranty may be invalidated if the cables have not been properly stored or handled according to Aginode requirements. When logged into the AGINODE site, all these documents and also others relating to design and installation testing etc

can be found **here**

Annex B

OF system polarity

The only way to automatically maintain the duplex polarity without having to think about it, is to include a crossover into all the OF link segments.
In other words, fibres pairs have to be swapped over (interchanged) into the patch panel on one side of every link segment.

Side A			Side B		
Port Number	Fibre Number	Colour of the fibre	Colour of the fibre	Fibre Number	Port Number
1	1	Blue	Orange	2	1
2	2	Orange	Blue	1	2
3	3	Green	Brown	4	3
4	4	Brown	Green	3	4
5	5	Grey	White	6	5
6	6	White	Grey	5	6
7	7	Red	Black	8	7
8	8	Black	Red	7	8
9	9	Yellow	Violet	10	9
10	10	Violet	Yellow	9	10
11	11	Pink	Aqua	12	11
12	12	Aqua	Pink	11	12

To be repeated several times (for every module) for a fully loaded patch panel.

LC pre-terminated assemblies

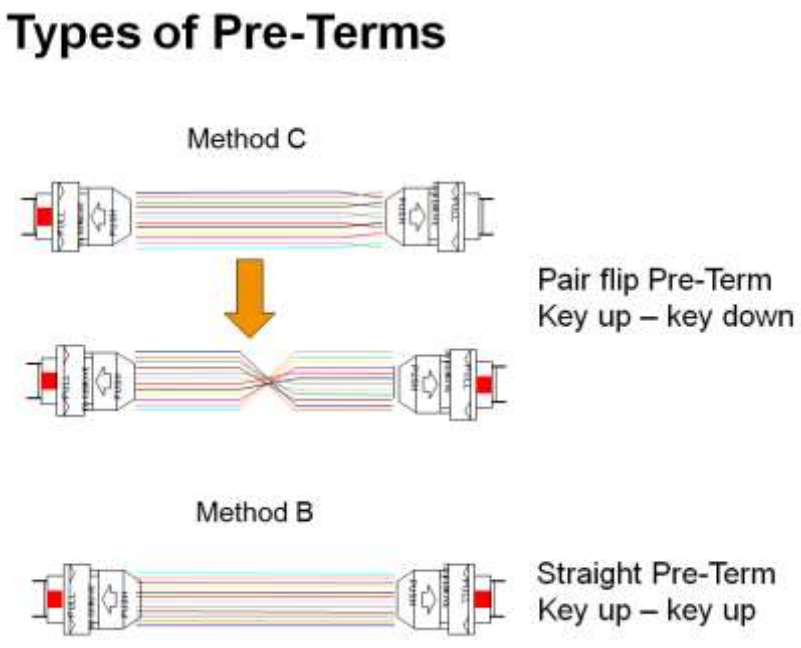
The connectors of the 900 µm pre-terminated assemblies are loaded with coloured boots as shown on the pictures (i.e. page 22).
The insertion has to be realised according to the colour coding sequence of the boots and NOT according to the colour of the fibres.
Indeed the colours of the boots are swapped over at one end of the pre-terminated assembly to facilitate error free implementation of the required fibre pair-flip.

The colour of the boot of the connectors has to match the colours indicated on the label located on the base of the LC adaptor module in front of the adaptors (see page 21).

Side A				Side B			
Port Number	Fibre Number	Colour of the boot	Colour of the fibre	Colour of the fibre	Colour of the boot	Fibre Number	Port Number
1	1	Blue	Blue	Orange	Blue	2	1
2	2	Orange	Orange	Blue	Orange	1	2
3	3	Green	Green	Brown	Green	4	3
4	4	Brown	Brown	Green	Brown	3	4
5	5	Grey	Grey	White	Grey	6	5
6	6	White	White	Grey	White	5	6
7	7	Red	Red	Black	Red	8	7
8	8	Black	Black	Red	Black	7	8
9	9	Yellow	Yellow	Violet	Yellow	10	9
10	10	Violet	Violet	Yellow	Violet	9	10
11	11	Pink	Pink	Aqua	Pink	12	11
12	12	Aqua	Aqua	Pink	Aqua	11	12

MTP/MPO OF polarity

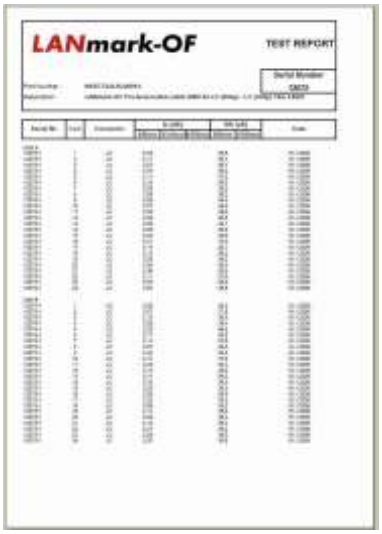
The polarity is automatically maintained (method B or C) for Aginode MTP system.



NB. Always maintain installation cleanliness practice! Close the drawer whenever you finish working on the panel and keep dust caps fitted.

Testing recommendations

Each pre-terminated (MTP or LC) assembly is 100% factory tested and a test report is always included in the packaging.



However, all fibres should be tested to ensure that the fibres and the connectors have not been affected by the installation process.

It will also ensure that

- the system polarity has been correctly managed
- all the connectors are clean

Note: if the Aginode 25 year system warranty is required, testing and submission of results for certification is a mandatory requirement.

Testing has to be performed according to the Aginode OF field testing procedure which is available from our website (see page 17).

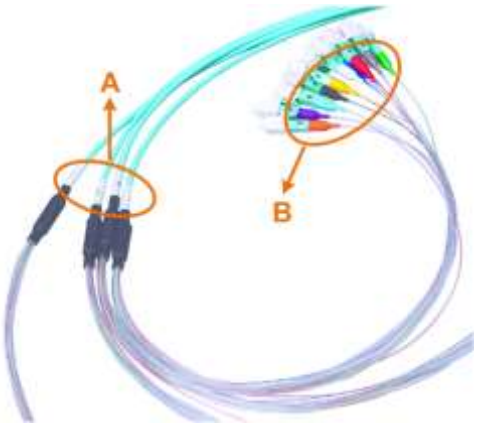
Annex C

Connection scheme of the pre-terminated assemblies

LC/LC pre-terminated assemblies with 900µm fan-outs on both ends

A label (A) is located on every leg at the rear of the fanout. Corresponding numbers are printed on the labels at both ends.

The LC connectors are loaded with coloured boots (B). The colours of the boot have been swapped over at one end of the assembly during manufacture.



Side A				Side B			
Leg Number	Fibre Number	Colour of the boot	Colour of the fibre	Colour of the fibre	Colour of the boot	Fibre Number	Leg Number
From 1 to 8	1	Blue	Blue	Orange	Blue	2	From 1 to 8
	2	Orange	Orange	Blue	Orange	1	
	3	Green	Green	Brown	Green	4	
	4	Brown	Brown	Green	Brown	3	
	5	Grey	Grey	White	Grey	6	
	6	White	White	Grey	White	5	
	7	Red	Red	Black	Red	8	
	8	Black	Black	Red	Black	7	
	9	Yellow	Yellow	Violet	Yellow	10	
	10	Violet	Violet	Yellow	Violet	9	
	11	Pink	Pink	Aqua	Pink	12	
	12	Aqua	Aqua	Pink	Aqua	11	

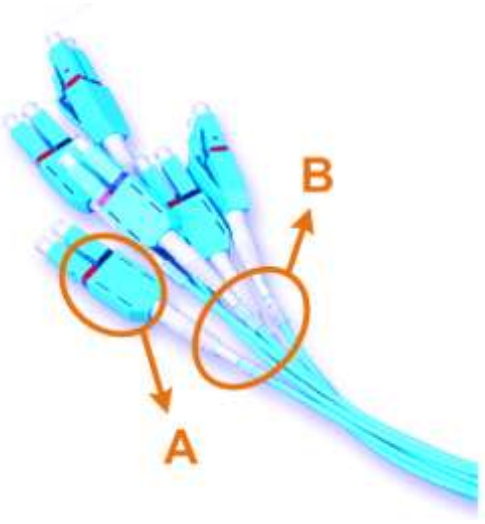
LC/LC pre-terminated patching assemblies (with 1x 900µm fan-out and 1x 2mm fan-out)

At the 900µm fan-out end the identification of the fibre is done using labels on the legs and coloured boots on the connector as it is for the previous type of preterm (900µm fan-out on both ends) – see previous page.

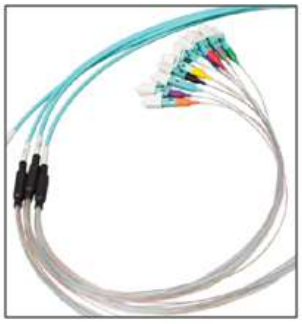
At the 2mm fan-out end the fibres are grouped by pairs in legs terminated with an uniboot duplex LC connector.

A label (B) is located on every leg at the rear of the fanout.

Each fibre is identified with a red or a black ring located on every duplex connector (A)



48 fibre pre-terminated assembly / 96 fibre assembly (legs 1 to 4)



900µm end				2mm end		
Leg number	Fibre number	Colour of the fibre	Colour of the boot	Colour of the fibre	Fibre number	Connector number
1	1	Blue	Blue	Orange	A	1
	2	Orange	Orange	Blue	B	
	3	Green	Green	Brown	A	2
	4	Brown	Brown	Green	B	
	5	Grey	Grey	White	A	3
	6	White	White	Grey	B	
	7	Red	Red	Black	A	4
	8	Black	Black	Red	B	
	9	Yellow	Yellow	Violet	A	5
	10	Violet	Violet	Yellow	B	
	11	Pink	Pink	Aqua	A	6
	12	Aqua	Aqua	Pink	B	
2	1	Blue	Blue	Orange	A	7
	2	Orange	Orange	Blue	B	
	3	Green	Green	Brown	A	8
	4	Brown	Brown	Green	B	
	5	Grey	Grey	White	A	9
	6	White	White	Grey	B	
	7	Red	Red	Black	A	10
	8	Black	Black	Red	B	
	9	Yellow	Yellow	Violet	A	11
	10	Violet	Violet	Yellow	B	
	11	Pink	Pink	Aqua	A	12
	12	Aqua	Aqua	Pink	B	
3	1	Blue	Blue	Orange	A	13
	2	Orange	Orange	Blue	B	
	3	Green	Green	Brown	A	14
	4	Brown	Brown	Green	B	
	5	Grey	Grey	White	A	15
	6	White	White	Grey	B	
	7	Red	Red	Black	A	16
	8	Black	Black	Red	B	
	9	Yellow	Yellow	Violet	A	17
	10	Violet	Violet	Yellow	B	
	11	Pink	Pink	Aqua	A	18
	12	Aqua	Aqua	Pink	B	
4	1	Blue	Blue	Orange	A	19
	2	Orange	Orange	Blue	B	
	3	Green	Green	Brown	A	20
	4	Brown	Brown	Green	B	
	5	Grey	Grey	White	A	21
	6	White	White	Grey	B	
	7	Red	Red	Black	A	22
	8	Black	Black	Red	B	
	9	Yellow	Yellow	Violet	A	23
	10	Violet	Violet	Yellow	B	
	11	Pink	Pink	Aqua	A	24
	12	Aqua	Aqua	Pink	B	

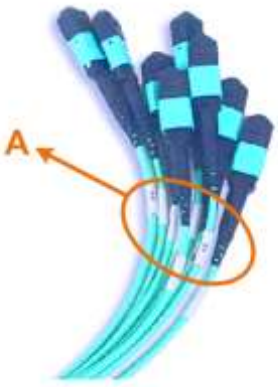
96 fibre pre-terminated assembly (legs 5 to 8)

900µm end				2mm end		
Leg number	Fibre number	Colour of the fibre	Colour of the boot	Colour of the fibre	Fibre number	Connector number
5	1	Blue	Blue	Orange	A	25
	2	Orange	Orange	Blue	B	
	3	Green	Green	Brown	A	26
	4	Brown	Brown	Green	B	
	5	Grey	Grey	White	A	27
	6	White	White	Grey	B	
	7	Red	Red	Black	A	28
	8	Black	Black	Red	B	
	9	Yellow	Yellow	Violet	A	29
	10	Violet	Violet	Yellow	B	
	11	Pink	Pink	Aqua	A	30
	12	Aqua	Aqua	Pink	B	
6	1	Blue	Blue	Orange	A	31
	2	Orange	Orange	Blue	B	
	3	Green	Green	Brown	A	32
	4	Brown	Brown	Green	B	
	5	Grey	Grey	White	A	33
	6	White	White	Grey	B	
	7	Red	Red	Black	A	34
	8	Black	Black	Red	B	
	9	Yellow	Yellow	Violet	A	35
	10	Violet	Violet	Yellow	B	
	11	Pink	Pink	Aqua	A	36
	12	Aqua	Aqua	Pink	B	
7	1	Blue	Blue	Orange	A	37
	2	Orange	Orange	Blue	B	
	3	Green	Green	Brown	A	38
	4	Brown	Brown	Green	B	
	5	Grey	Grey	White	A	39
	6	White	White	Grey	B	
	7	Red	Red	Black	A	40
	8	Black	Black	Red	B	
	9	Yellow	Yellow	Violet	A	41
	10	Violet	Violet	Yellow	B	
	11	Pink	Pink	Aqua	A	42
	12	Aqua	Aqua	Pink	B	
8	1	Blue	Blue	Orange	A	43
	2	Orange	Orange	Blue	B	
	3	Green	Green	Brown	A	44
	4	Brown	Brown	Green	B	
	5	Grey	Grey	White	A	45
	6	White	White	Grey	B	
	7	Red	Red	Black	A	46
	8	Black	Black	Red	B	
	9	Yellow	Yellow	Violet	A	47
	10	Violet	Violet	Yellow	B	
	11	Pink	Pink	Aqua	A	48
	12	Aqua	Aqua	Pink	B	

MTP/MTP pre-terminated assemblies with 2mm fan-outs on both ends

A label (A) is located on every leg at the rear of the MTP connector (A).

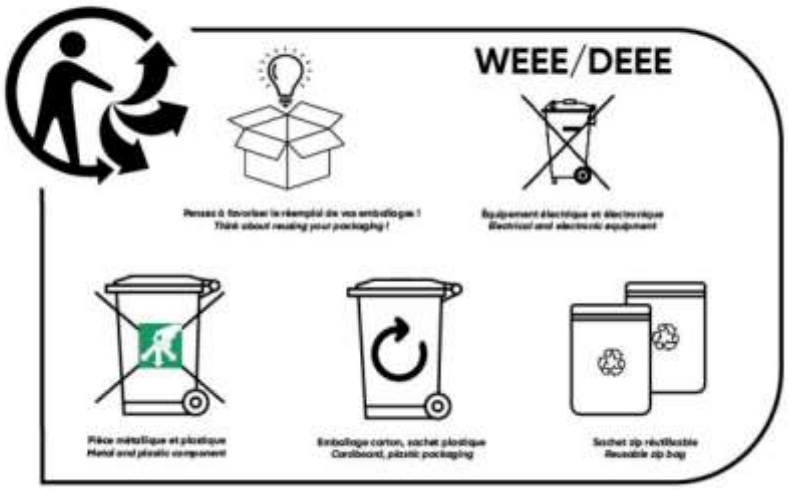
Corresponding numbers are printed on the labels at both ends.



Annex D

End of life management

4. INSTRUCTIONS DE FIN DE VIE
END LIFE INSTRUCTIONS



Disclaimer

This document is a guideline only. International and local procedures and safety standards must be observed and followed at all times.

Aginode will not be held liable for any damage or injury to personnel, equipment or business directly or indirectly as a result of using this document in part or in whole.

The practices contained herein are designed as a guide for use by persons having the required technical skill at their own discretion and risk. The recommended practices are based on average conditions. Aginode does not guarantee any favourable results or assume any liability in connection with this document.

Aginode does not assume any responsibility for the accuracy or completeness of this document.

The user should review the information to ensure conformity to the current applicable codes and regulations and to the project requirements.

Aginode reserves the right to change the technical specifications at any time without notice.

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