LANmark-OF Plug&Play Patch Panel Sliding Black

PRODUCT INSTALLATION GUIDE

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Nexans

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Product References

Part Number	Description
N439.3MPP	LANmark-OF Plug&Play Patch Panel Sliding Black

Document information

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Contact address	Alsembergsesteenweg 2, b3 1501 Buizingen Belgium
Phone	+32 2 363 38 00
Fax	+32 2 365 09 99
Website	www.nexans.com/ncs
E-mail	info.ncs@nexans.com

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General

Installation is to be performed by qualified service personnel.

The installation of the LANmark-OF Plug&Play Patch Panel 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:

- Integrated front guide for patch cord
- 1 labelling strip
- 4 cage-nuts with screws
- 1 screw and star washer for earthing
- 1 screw and washer kit for optional splice tray fixing

.

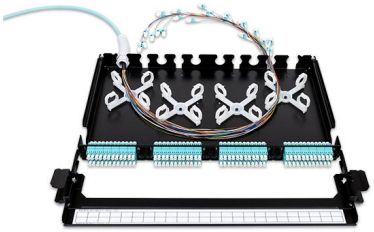
All other ancillaries (e.g. splice trays) must be purchased separately.
The product part numbers are mentioned where applicable in the following.

Possible configurations

1. **With adaptor plate and pre-terminated cable:**

This is selected for ease of installation, particularly where the following elements are determining factors:

- the installation time window is short, and /or
- where there are a large number of connectors to be installed, and/or
- where minimum link loss performance is required

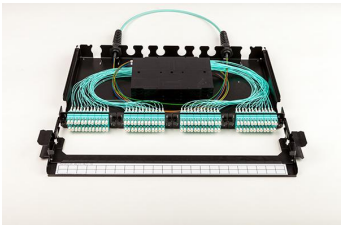


2. **With adaptor plate and termination with direct connectorisation:**

This is suited primarily to multimode fibres. Direct termination on singlemode fibres is restricted to specific connector types (see table below).

3. **With adaptor plate and splicing system:**

This is suitable for both tight buffered and loose tube (including Micro-Bundle) constructions, with appropriate use of splice protectors and splice management.



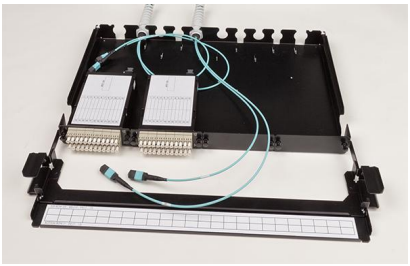
Loose Tube 250µm fibres	**LC**
Fusion splicing MM	Yes
Connectorisation MM	Yes with microtube
Fusion splicing SM	Yes (preferred)
Connectorisation SM	with microtube (available but not preferred)

Tight Buffer 900µm fibres	**LC**
Fusion splicing MM	Yes Using heatshrink splice protectors
Connectorisation MM	Yes
Fusion splicing SM	Yes (preferred) Using heatshrink splice protectors
Connectorisation SM	Yes (available but not preferred)

4. With cassettes and MTP pre-terminated cable:

This is selected for ease of installation, particularly where the following elements are determining factors:

- easy migration to other applications and required migration path to 40G
- short installation time
- minimum link loss performance is required



Cassettes and adaptor plates

1. MPO/MTP cassettes

When needed up to 4 cassettes can be installed into the panel

Part Number	*Description*
N441.4L12LC4	LANmark-OF Plug&Play Low Loss Module 12 LC OM4 Aqua
N441.4L24LC4	LANmark-OF Plug&Play Low Loss Module 24 LC OM4 Aqua
N441.4M12LC0	LANmark-OF Plug&Play Module 12 LC Singlemode
N441.4M24LC0	LANmark-OF Plug&Play Module 24 LC Singlemode



Unused positions can be populated with a blank filler.

Part Number	*Description*
N441.2MBP	LANmark-OF Plug&Play Blank Filler

2. Adaptor plates for splicing, direct termination and pre-term

Alternatively up to 4 adaptor plates can also be installed.

Part Number	*Description*
N205.AMTP6MMUD	LANmark-OF Adaptor Plate 6 MTP Multimode Key Up Key Down Aqua
N205.AMTP6MMUU	LANmark-OF Adaptor Plate 6 MTP Multimode Key Up Key Up Grey
N205.ALC12MMA	LANmark-OF Adaptor Plate 12 LC Multimode Aqua
N205.ALC24MMA	LANmark-OF Adaptor Plate 24 LC Multimode Aqua
N205.ALC12SMB	LANmark-OF Adaptor Plate 12 LC Singlemode Blue
N205.ALC24SMB	LANmark-OF Adaptor Plate 24 LC Singlemode Blue
N205.ALC12SAG	LANmark-OF Adaptor Plate 12 LC APC Singlemode Green
N205.ALC24SAG	LANmark-OF Adaptor Plate 24 LC APC Singlemode Green
N205.ASC06MMA	LANmark-OF Adaptor Plate 06 SC Multimode Aqua
N205.ASC12MMA	LANmark-OF Adaptor Plate 12 SC Multimode Aqua
N205.ASC06SMB	LANmark-OF Adaptor Plate 06 SC Singlemode Blue
N205.ASC12SMB	LANmark-OF Adaptor Plate 12 SC Singlemode Blue
N205.ASC06SAG	LANmark-OF Adaptor Plate 06 SC Singlemode APC Green
N205.ASC12SAG	LANmark-OF Adaptor Plate 12 SC Singlemode APC Green
N205.AST06MMM	LANmark-OF Adaptor Plate 6 ST Multimode
N205.AST06SMM	LANmark-OF Adaptor Plate 6 ST Singlemode







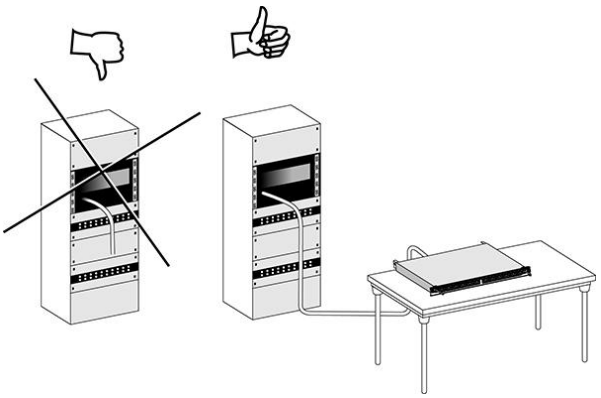

Phase 1 - Preparation of the patch panel

1.1 Installing the cable

Ensure a length of spare cable (slack) is provided within the cabinet (6m recommended). 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.



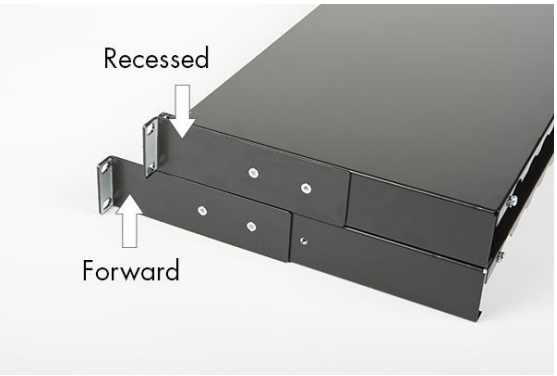
1.2 Elements of the patch panel

1.3 Installing the patch panel into the cabinet

1. The L shaped chassis support brackets can be fitted in either a forward or recessed position.

   By default they are installed in the forward position to provide maximum space in front of the panel.

   They can be moved to the recessed position if needed - the “right” position being dependant on the available space between the 19” frame and the cabinet door.



2. Remove the sliding drawer from the chassis (fixed part).

   a. Lift the drawer up to release it from the chassis.

b. Keep the drawer in an upwards position and pull it forwards.

c. When reaching the end of the chassis, lift the drawer further to unhook it. Now both parts can be separated.

3. Position the chassis into the rack.

Remember to complete earthing requirements for metallic items using a suitable earthing cable and the screw / washer provided on the chassis.

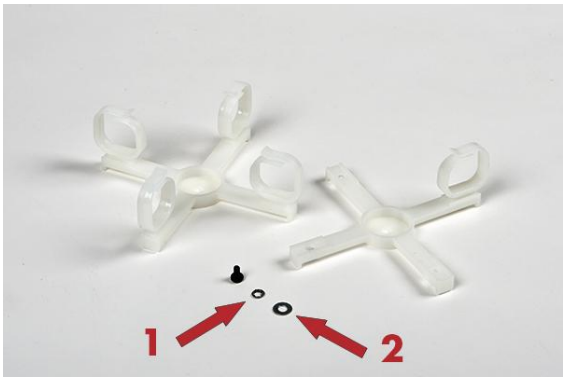
NB. The holes for the screw are located at the rear of the panel on the left and right hand side of the chassis, but the screw is located at the left hand (see phase 3).

Thread the Pre-Term or cable through the chassis of the patch panel.
Make sure to respect the cable's minimum bending radius while handling the cable.

Phase 2A - Adaptor plate and termination with pre-terminated assemblies

For pre-terminated OF cable general pulling rules and pulling part removal procedure, please refer to the Nexans FO installation guide and pre-terminated cable supplement. These documents can be viewed when logged into the NCS website.

1. Sliding drawer preparation for pre-term installation



Install the 4 support bases using the 4 small screws, washers (both locking (**1**) and flat (**2**)) from the screw kit provided and insert 4 loop rings on every support base, with the loop ring opening facing inwards. They will be used later.

The fibre organisers are available separately (bag of 10 pieces).

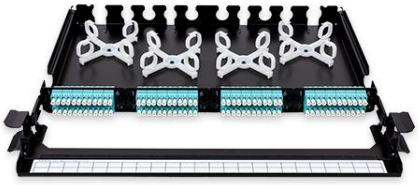
Part Number	*Description*
N890.070	LANmark-OF fibre organiser 10x

The screw kit is provided with the organisers.

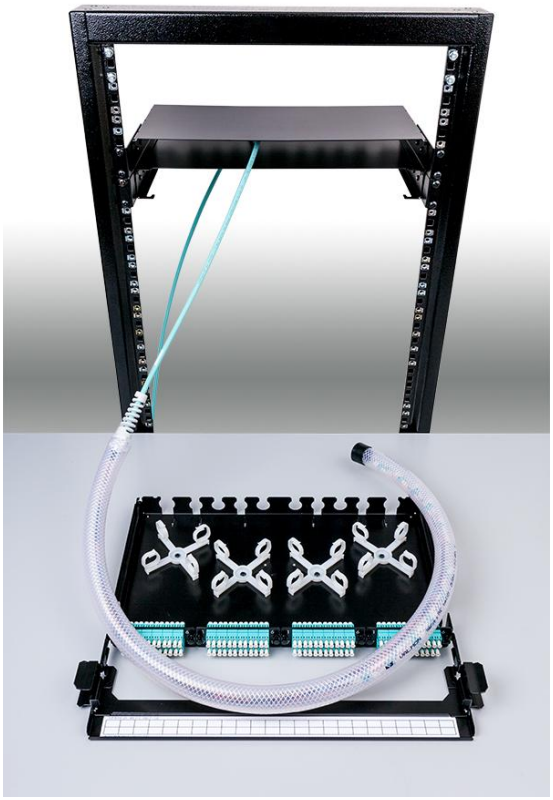
Arrows indicate loop rings fixing points.

2. Installation process in the patch panel

1. Install up to 4 adaptor plates onto the drawer.

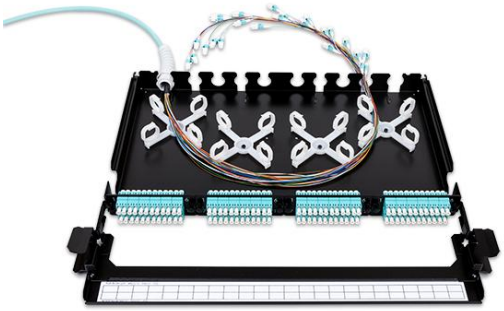


2. With the protective tube still in place, insert the cable end from the rear of the chassis.

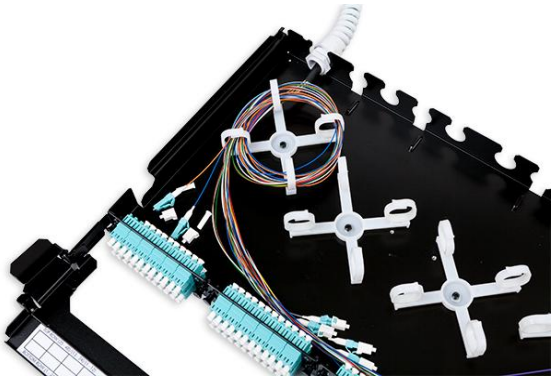


3. Carefully remove the protective tube to access the cable gland.

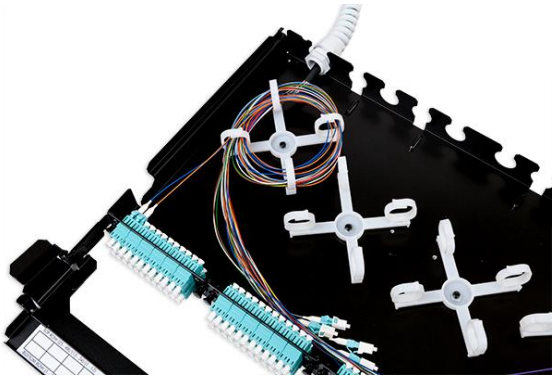
4. The gland fixing locations on the LANmark-OF patch panels are open at the top and are therefore suitable for use with pre-terminated assemblies.
Slide in and fasten the gland in an appropriate slot.



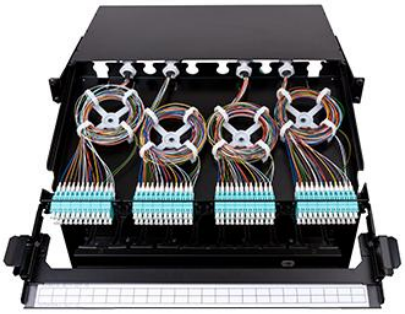
5. Coil the fibres into the loops rings.
Remove the dust protection caps on the inside of the couplers where connectors will be inserted.



6. A check for the cleanliness of the couplers and connectors is required prior to the insertion of the connectors – see Important Note below.
   Insert connectors according to the colour coding/position sequence of the couplers (see Annex B).



7. See page 24 for finalisation of the installation.



Important note

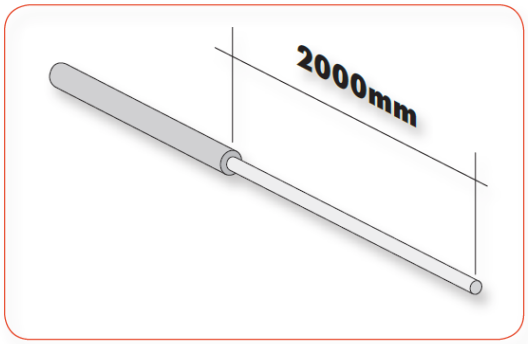
The cleaning of all the optical fibre connectors prior to the installation (pigtail, patch cords etc) is a critical factor that needs to be applied at all times.

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

See Annex A

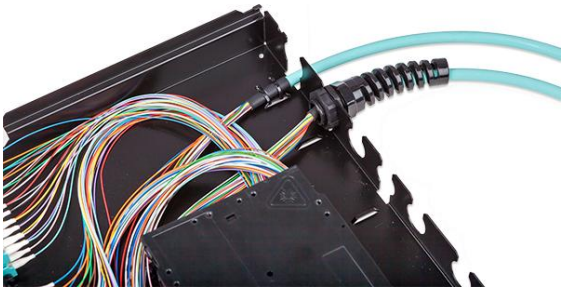
Phase 2B - Adaptor plate and termination with direct connectorisation

Remove approximately 2 metres of the outer sheath and the aramid/glass yarns from the cable.
In addition, for 250µ fibres, the tube must also be removed. At least two loops of fibre will be required to be provided in the loop rings.
Consult the guideline documents for specific jacket removal requirements regarding the cable type being installed.
These documents can be viewed when logged into the NCS website.
Special consideration may be required for grounding corrugated metal jacket constructions. Refer to customer / site installation specifications.
Avoid damaging the fibres while cutting the outer jacket and yarns. Collect all waste and dispose of correctly.
Use the correct tools in order not to damage the fibres while cutting the tube (Loose tube or Micro-Bundle structures).
Make sure to clean the fibres (with appropriate and approved cleaning solvents) to remove the gel.



Secure the outer jacket of the cable onto the base at the back of the patch panel by means of a cable gland or by tie-wraps.

Cable glands are preferred, cable gland (20mm / PG11-13,5 or 25mm / PG16- 21) has to be used to affix the cable to the patch panel. If no cable gland is used, then we tie wraps can be used. Ties shall not significantly deform the cable sheath – ties should be hand tight.



20mm hole

Part Number	*Description*
N890.148	LANmark-OF Cable gland rubber boot 20 mm 10x

Suitable for cable diameters 6 – 12 mm

25mm hole: PG16-21

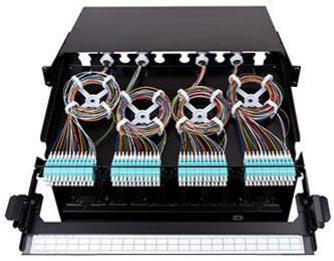
Part Number	*Description*
N890.146	LANmark-OF Cable gland 25 mm

Suitable for cable diameters 12.3-18 mm

Apply a permanent label on the cable just behind the gland for identification purposes. Provide at least 2 spare loops of fibre in the patch panel and arrange them in the loop rings.

Install up to 4 adaptor plates onto the drawer.

Measure the length of each fibre to the coupler respecting both bending radius and the color sequence, then cut off the surplus and dispose of it correctly.



Refer to “Recommendations to maintain OF duplex channel polarity”- a technical paper, which is available from the NCS website under “File Library”. Knowledge of this document content will assist in efficient preparation and storage of the fibres within the rings (see annex B).

Take the fibre out of the loop rings and mount the connectors on the fibre. When mounting connectors on 250 µ fibre, you will need to use an optional microtube (N890.045) to reduce risk of damaging the fibre. Refer to the ‘Anaerobic OF toolkit: N102.230 –Revision C’ NCS Installation Guides for detailed information.

It is advisable to label the fibres for easy identification. Labels must not compromise bend radius of the fibre cores. Remove the dust protection caps on the inside of the couplers where connectors will be inserted.

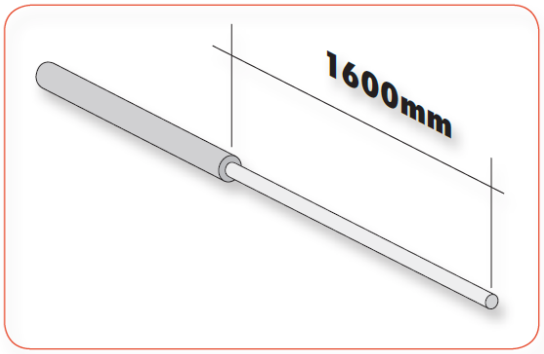
Loop the fibres back in the loop rings and insert connectors according to the colour coding / position sequence of the couplers.

A check for the cleanliness of the couplers and connectors is required prior to the insertion of the connectors.
Refer to the ‘OF connector Inspection cleaning and testing general guidelines’ NCS technical paper for detailed information.
NB. Always maintain installation cleanliness practice! Close the drawer whenever you finish working on the panel and keep dust caps fitted.

See page 24 for finalisation of the installation.

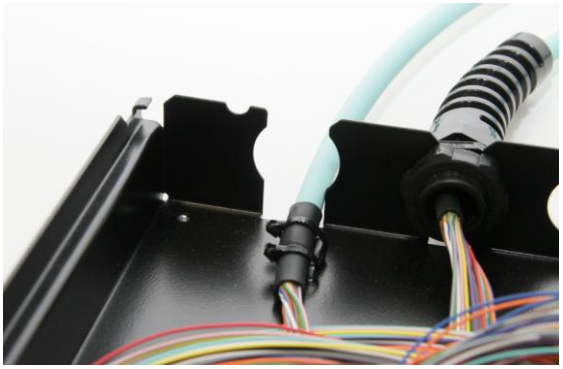
Phase 2C Adaptor plate and termination with fusion splicing

Strip at least 1.6 meters of cable sheath to allow enough spare fibre for later maintenance purposes. Consult the guideline documents for specific jacket removal requirements regarding the cable type being installed.
These documents can be viewed when logged into the NCS website.
Special consideration may be required for grounding corrugated metal jacket constructions. Refer to customer / site installation specifications.
Avoid damaging the fibres while cutting the outer jacket and yarns. Collect all waste and dispose of correctly.
Use the correct tools in order not to damage the fibres while cutting the tube (Loose tube or Micro-Bundle structures).



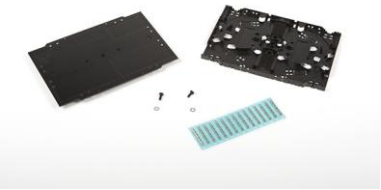
Secure the outer jacket of the cable onto the base at the back of the patch panel by means of a cable gland or by tie-wraps.

Cable glands are preferred, cable gland (see page 15) has to be used to affix the cable to the patch panel.
If no cable gland is used, then tie wraps can be used. Ties shall not significantly deform the cable sheath – ties should be hand tight.



Install the first splice cassette on the drawer using the 2 longer screws and associated locking washers from the screw kit. The additional cassettes will be installed at a later stage. To connect the additional splice cassettes the hinges at the back of the splice cassettes will be used.
Up to 4 splice cassettes can be installed according to the number of fibres to be terminated.
Splice cassettes must be ordered separately.
2 type of splice cassette are available:

The splice cassette for aluminium protection (N890.091) can accommodate 24 splices allowing a maximum of 96 splices per patch panel.
Aluminium splice protectors - N890.003 (pack of 150 pieces)
NB. Tool N890.004 must be used with aluminium splice protectors.

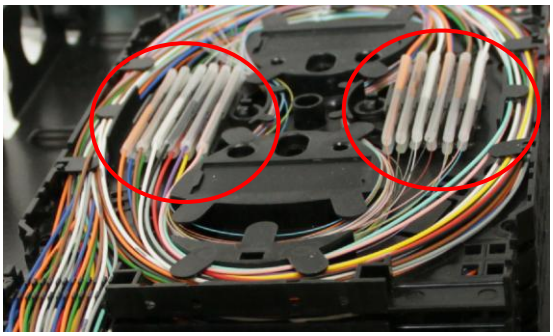


Important Note: N890.091 can only be used with maxistrip pigtails and cables with 250 um coated fibres. The aluminium protection is not suitable for use with 900µm coated fibres.

Arrows indicate cassette fixing points.

The splice cassette for heat shrink protection (N890.090) can accommodate 12 splices allowing a maximum of 48 splices per patch panel when using Tight Buffer pigtails of 900 µm or 24 splices allowing a maximum of 96 splices per patch panel when using Maxistrip pigtails of 250µm (see picture below).

Heat shrink splice protectors - N890.021 (pack of 100 pieces)

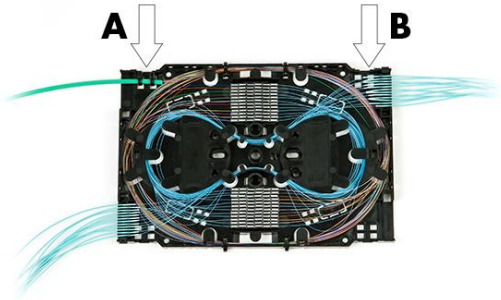


As highlighted on the picture, two heat shrink protected splices shall be installed on top of each other in each of the 2x 6 splice holders of the cassette to accommodate 24 splices on a single cassette.

For both type of splice cassette only one cover (N890.093) is required to close the last splice cassettes at the top.
Additional splice cassettes are fixed with hinges to the cassette below it. With such an arrangement the additional splice cassettes can be lifted and tilted for improved access to the splices beneath them.

Install up to 4 adaptor plates onto the drawer.

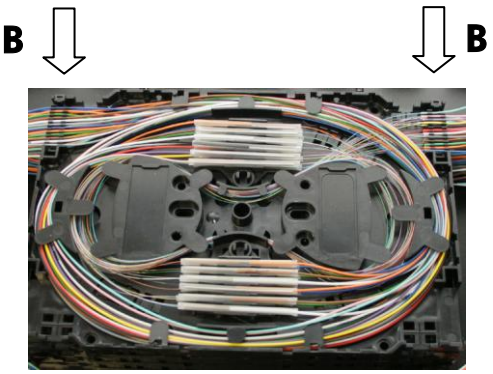
Metallic splice protectors



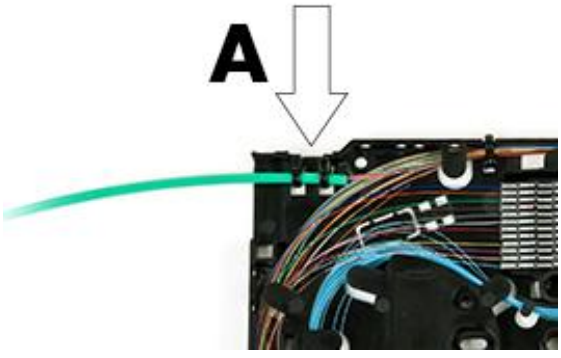
Apply a permanent label on the cable just behind the gland for identification purposes.

Up to 4 splice trays may be installed to accommodate 48 heat-shrink fibre splices when using Tight Buffer pigtails or 96 heat-shrink or metallic fibre splices, when using Maxistrip pigtails of 250µm.
Splice trays for fibre splice protections are available in metallic or heat-shrink versions.
900µm coated fibres shall be fixed in the entry combs of the splice trays (B).

Heat shrink splice protectors

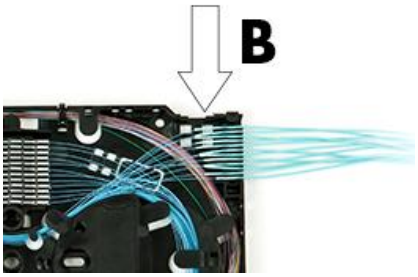


For Loose Tube and Micro-Bundle cable structures remove surplus tube from the fibre to allow the remaining tube to be fixed on the splice tray (A) by means of tie wraps. The tie wraps are not intended to provide strain relief but are to keep the tube in the right position. Do not over-tighten the tie wraps on the tube especially when working with Micro-Bundle cables.

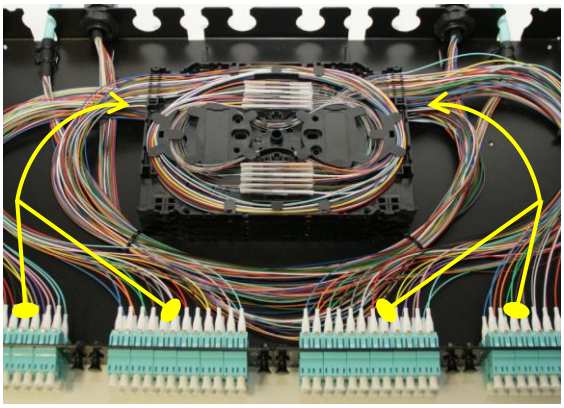


Clean the fibres with an approved and suitable solvent to remove the gel. Make sure that there are at least 2 loops of fibres in the splice tray.

A check for the cleanliness of the couplers and connectors is required prior to the insertion of the connectors.
Refer to the ‘OF connector Inspection cleaning and testing general guidelines’ NCS technical paper for detailed information.



Insert the pigtails connectors in the couplers. Measure the length of the 900µ buffer needed to fix the pigtail in the comb (B) of the splice tray keeping in mind the bending radius. Make sure to use the entry comb on the side of the connectors you have just installed as shown in the picture.

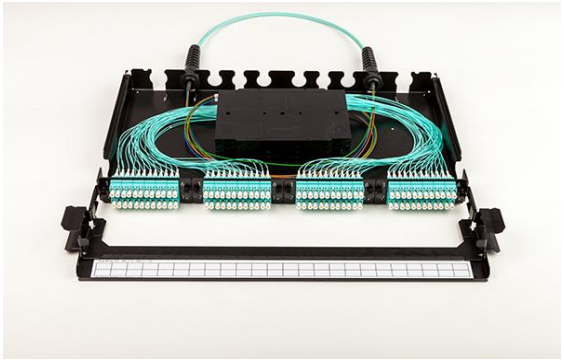


The fibres from the pigtails should make 2 loops in the opposite direction.
Nexans Maxistrip pigtails allow the removal of the 900µ buffer in one operation after being cut to the right length.

A minimum of 2 loops of fibre core from the pigtail is advised in the splice tray.

Cut the fibres 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.
The “Recommendations to maintain duplex OF channel polarity” technical paper, which is available from our NCS website (under the File Library), should be considered when choosing the colour order. (See Annex B)

Note: Only one cover is needed on top of the last cassette whatever the number of cassettes installed in the panel.



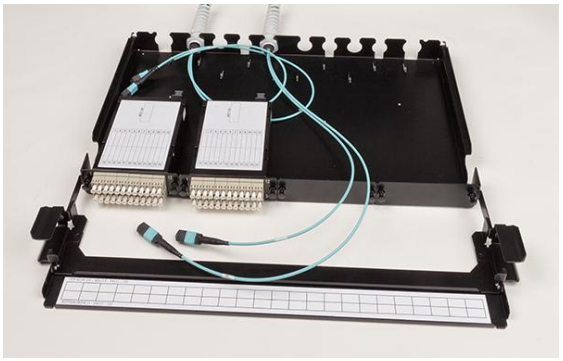
See page 24 for finalisation of the installation.

Phase 2D - Cassettes and termination with MTP pre-terminated cable

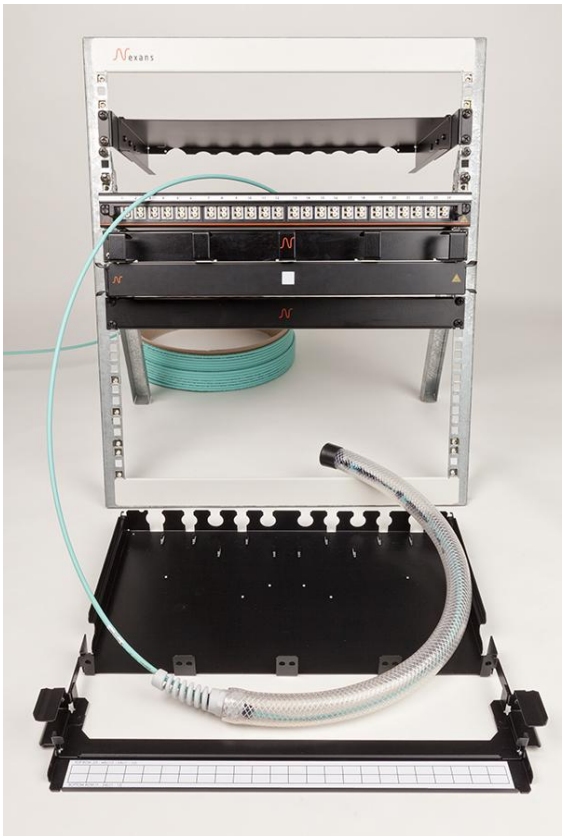
For pre-terminated OF cable general pulling rules and pulling part removal procedure, please refer to the Nexans FO installation guide and pre-terminated cable supplement. These documents can be viewed when logged into the NCS website.

Installation process in the patch panel

1. Install up to 4 MTP cassettes onto the drawer.

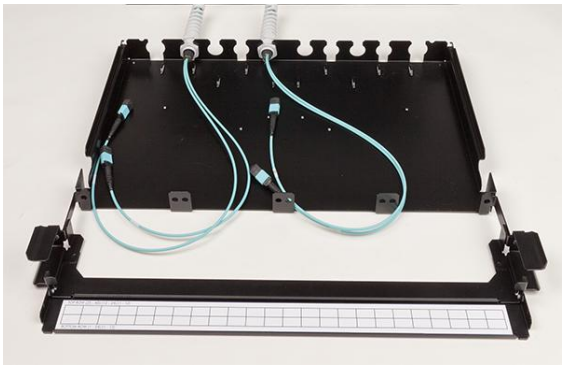


2. With the protective tube still in place, insert the cable end from the rear of the chassis.

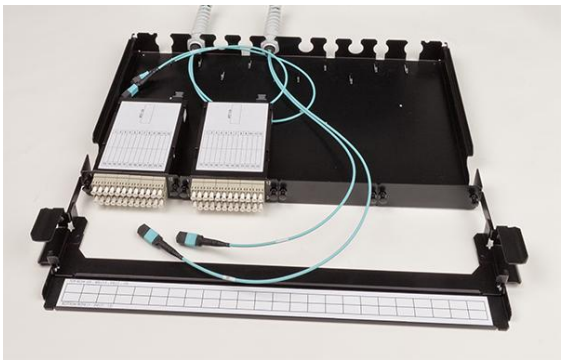


3. Carefully remove the protective tube to access the cable gland.

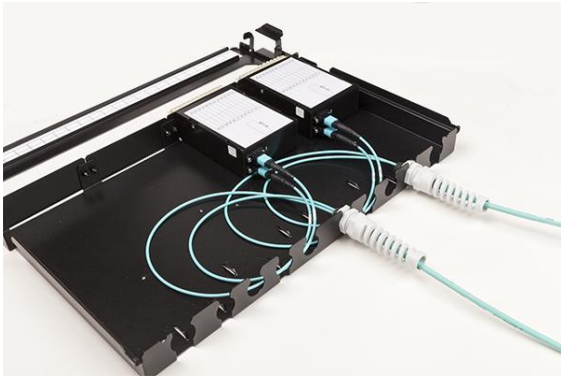
4. The gland fixing locations of the LANmark-OF patch panels are open at the top and are therefore suitable for use with pre-terminated assemblies.
Slide in and fasten the gland in an appropriate slot.



5. Remove the MTP connector dust caps at the back of the cassettes; clean the connector through the MTP adaptor – see Important Note below.



6. Coil the fibre, clean and insert connectors according to the correct sequence (each MTP fan-out is labeled).



OF system polarity: see Annex B.

7. See page 24 for finalisation of the installation.

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 performances levels are achieved during commissioning and operation, the cleanliness of all fibre interfaces needs to be maintained.

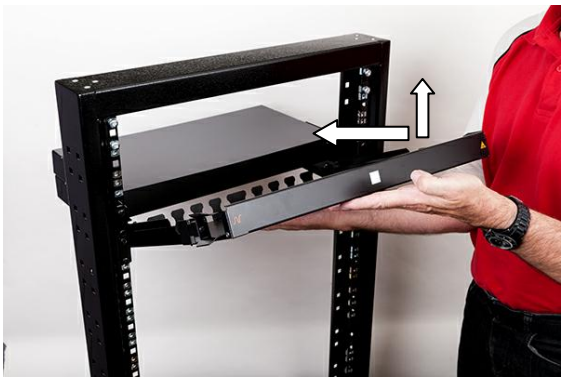
See Annex A

Phase 3 – Finalisation of the installation

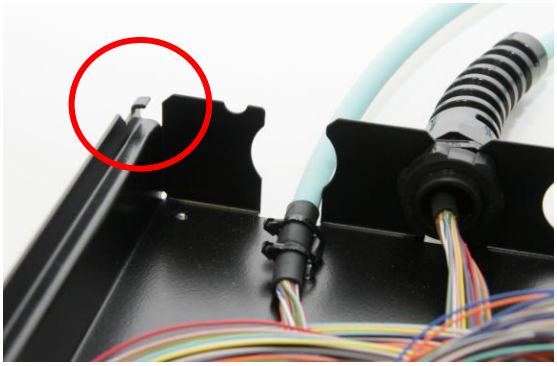
The drawer assembly can now be refitted to the chassis.
Lift-up the drawer to engage it into the chassis.

First engage left and right locks into the chassis.

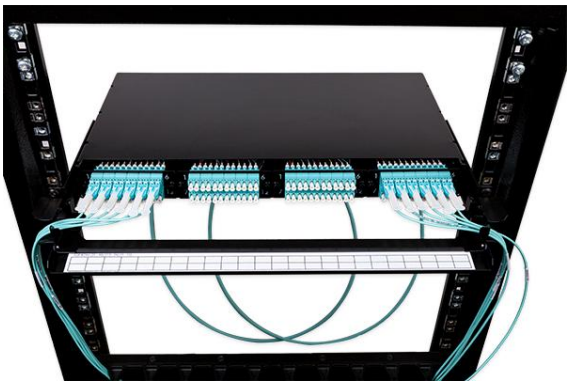
Then lower the drawer and slide it inside the chassis.



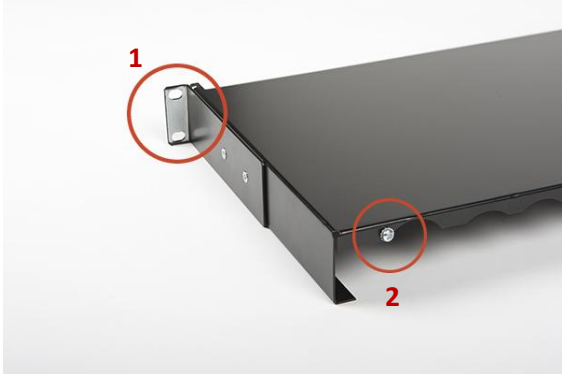
The locking mechanism of the chassis is highlighted in the picture.



For installation of the self adhesive label, open the cover of the patch guide manager. Stick the label on the inside of the cover.
Label according to today´s network administration standards.
Label the ports conform with the site labeling scheme.

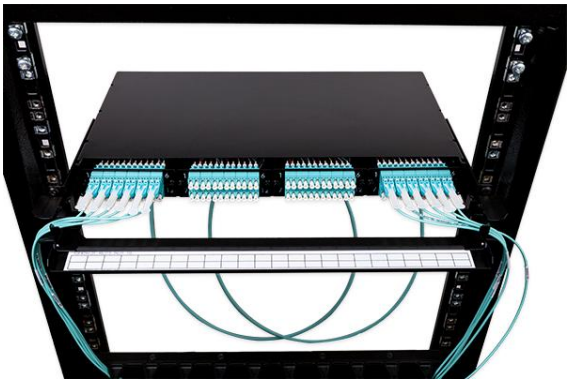


The rear side of the L shaped support bracket is unpainted (1) to ensure automatic earth connection with Nexans cabinets' frames or other unpainted 19" frames.
If the frames are painted, an earth connection has to be made to the chassis using an earth lead (2).
Spare / slack cable should then be appropriately 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 Nexans 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.

IMPORTANT NOTE – 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 performances levels are achieved during commissioning and operation, the cleanliness of all fibre interfaces needs to be maintained.

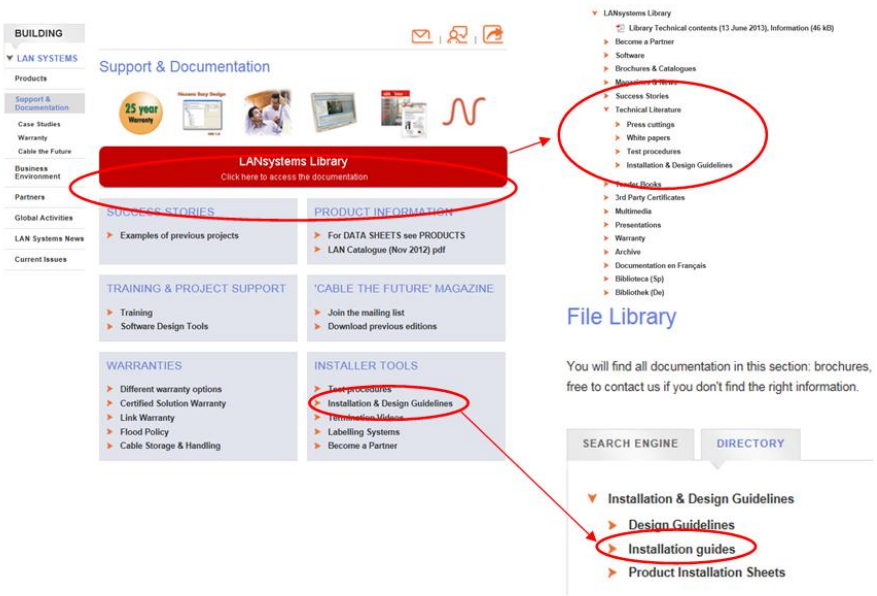
The Nexans **OF connector Inspection, Cleaning & Testing general guidelines**

can be downloaded from the Nexans website.

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

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

can be found **here**



MTP/MPO OF polarity

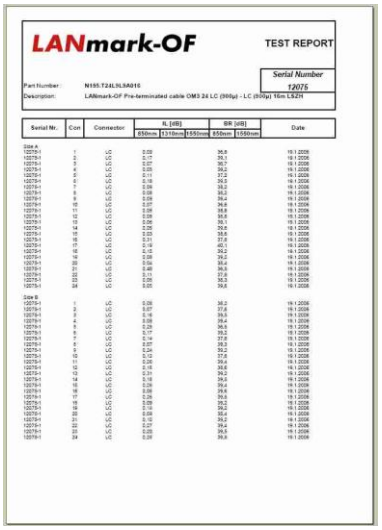
The only way to automatically maintain the duplex polarity without having to think about it, is to include a crossover into all the OF link segments. In other words, fibres pairs have to be swapped over (interchanged) into the patch panel on one side of every link segment.

The polarity is automatically maintained (method C) for Nexans 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 MTP Pre-Terminated 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 Nexans 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 Nexans OF field testing procedure which is available from our website (see page 2).

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.

Reverse-pair wiring - OF Cable termination scheme							
OF Patch panel - Side A				OF Patch panel - Side B			
Campus BB: CD side				Campus BB: BD side			
Building BB: BD side				Buiding BB: FD side			
FTTD: FD side				FTTD: CP side (ZD box)			
Fibre coding		Front panel position		Fibre coding		Front panel position	
Colour	Pair	SC	LC (*)	Colour	Pair	SC	LC (*)
Blue	1	1	1a	Orange	1	1	1a
Orange		2	1b	Blue		2	1b
Green	2	3	2a	Brown	2	3	2a
Brown		4	2b	Green		4	2b
Grey	3	5	3a	White	3	5	3a
White		6	3b	Grey		6	3b
Red	4	7	4a	Black	4	7	4a
Black		8	4b	Red		8	4b
Yellow	5	9	5a	Violet	5	9	5a
Violet		10	5b	Yellow		10	5b
Pink	6	11	6a	Turquoise	6	11	6a
Turquoise		12	6b	Pink		12	6b
Blue + 1 ring	7	13	7a	Orange + 1 r.	7	13	7a
Orange + 1 r.		14	7b	Blue + 1 ring		14	7b
Green + 1 r.	8	15	8a	Brown + 1 r.	8	15	8a
Brown + 1 r.		16	8b	Green + 1 r.		16	8b
Grey + 1 r.	9	17	9a	White + 1 r.	9	17	9a
White + 1 r.		18	9b	Grey + 1 r.		18	9b
Blue + 2 rings	10	19	10a	Orange + 2 r.	10	19	10a
Orange + 2 r.		20	10b	Blue + 2 rings		20	10b
Green + 2 r.	11	21	11a	Brown + 2 r.	11	21	11a
Brown + 2 r.		22	11b	Green + 2 r.		22	11b
Grey + 2 r.	12	23	12a	White + 2 r.	12	23	12a
White + 2 r.		24	12b	Grey + 2 r.		24	12b

(*): To be repeated twice of 4 times for a fully loaded patch panel (48 or 96 fibres)

Disclaimer

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

Nexans Cabling Systems 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.

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