Optical Fibre Preloaded Patch Panels

PRODUCT INSTALLATION GUIDE

November 2012

Nexans

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Product References

Part Number	Description
N439.2B24LCMM	LANmark-OF Preloaded Patch Panel 24 LC Multimode Sliding Black
N439.2B24LCSM	LANmark-OF Preloaded Patch Panel 24 LC Singlemode Sliding Black
N439.2B48LCMM	LANmark-OF Preloaded Patch Panel 48 LC Multimode Sliding Black
N439.2B48LCSM	LANmark-OF Preloaded Patch Panel 48 LC Singlemode Sliding Black
N439.2B96LCMM	LANmark-OF Preloaded Patch Panel 96 LC Multimode Sliding Black
N439.2B96LCSM	LANmark-OF Preloaded Patch Panel 96 LC Singlemode Sliding Black
N439.2B24SCMM	LANmark-OF Preloaded Patch Panel 24 SC Multimode Sliding Black
N439.2B24SCSM	LANmark-OF Preloaded Patch Panel 24 SC Singlemode Sliding Black
N439.2B48SCMM	LANmark-OF Preloaded Patch Panel 48 SC Multimode Sliding Black
N439.2B48SCSM	LANmark-OF Preloaded Patch Panel 48 SC Singlemode Sliding Black
N883.2B24LCMM	LANsense Preloaded Patch Panel 24 LC MM Sliding Black
N883.2B24LCSM	LANsense Preloaded Patch Panel 24 LC SM Sliding Black
N883.2B48LCMM	LANsense Preloaded Patch Panel 48 LC Multimode Sliding Black
N883.2B48LCSM	LANsense Preloaded Patch Panel 48 LC Singlemode Sliding Black
N883.2B96LCMM	LANsense Preloaded Patch Panel 96 LC Multimode Sliding Black
N883.2B96LCSM	LANsense Preloaded Patch Panel 96 LC Singlemode Sliding Black
N883.2B24SCMM	LANsense Preloaded Patch Panel 24 SC Multimode Sliding Black
N883.2B24SCSM	LANsense Preloaded Patch Panel 24 SC Singlemode Sliding Black
N883.2B48SCMM	LANsense Preloaded Patch Panel 48 SC Multimode Sliding Black
N883.2B48SCSM	LANsense Preloaded Patch Panel 48 SC Singlemode Sliding Black

Document information

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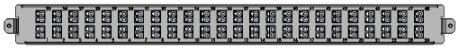
Published by	Nexans Cabling Solutions
Contact address	Alsembergsesteenweg 2, b3 1501 Buizingen Belgium
Phone	+32 2 363 38 00
Fax	+32 2 365 09 99
Website	www.nexans.com/lansysytems
E-mail	info.ncs@nexans.com

Important Notice

Installation is to be performed by qualified service personnel.

The Installation of any fibre 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.

The patch panels are pre-loaded with SC or LC adaptors and are available in
medium and high density versions. The medium density patch panel provides 24
SC or 48 LC connections, while the high density version has 48 SC or 96 LC
connections.
Singlemode and multimode versions are available.



LANmark-OF PRE-LOADED 96LC FRONT PANEL LAYOUT

LANmark-OF PRE-LOADED 48LC FRONT PANEL LAYOUT

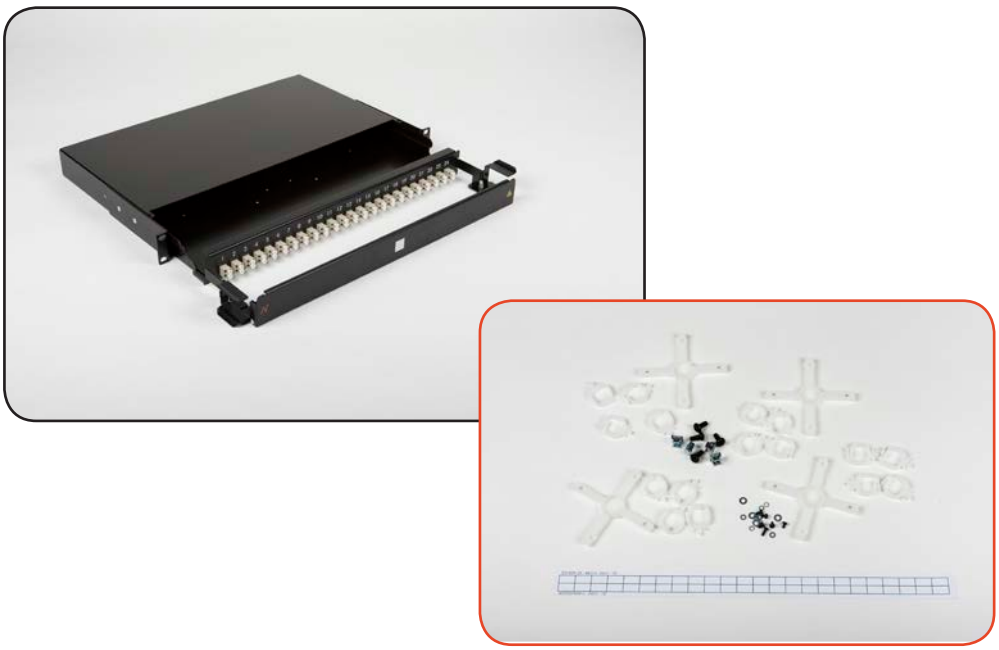
LANmark-OF PRE-LOADED 48SC FRONT PANEL LAYOUT

LANmark-OF PRE-LOADED 24SC FRONT PANEL LAYOUT

Each patch panel is supplied with:

- Pre-loaded SC or LC adaptors
- Integrated front guide for patch cord
- 1 labelling strip
- 4 cage-nuts with screws
- 4 support bases and 16 loop rings for fibre management
- 1 screw and star washer for earthing
- 1 screw and washer kit for loop ring support bases and optional splice trays fixation

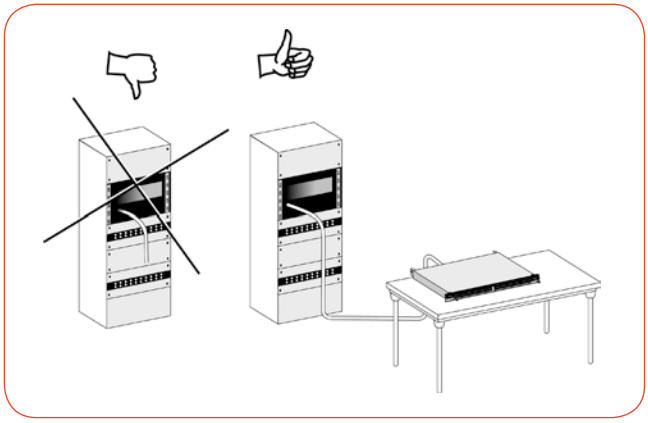
All other ancillaries (E.g. splice trays) must be purchased separately, the product part numbers are mentioned where applicable.

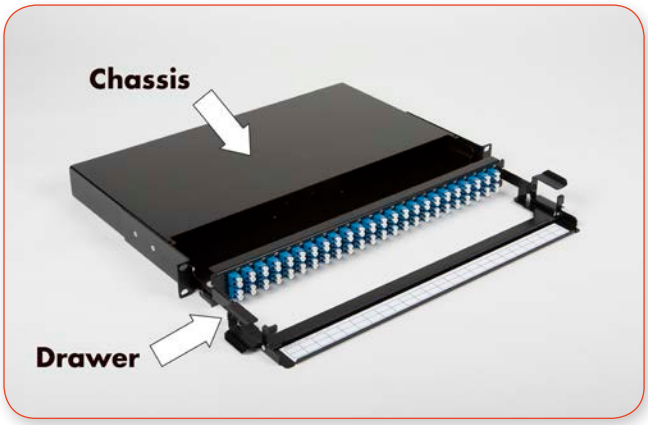


Phase 1 Preparation of the patch panel

Ensure a length of spare cable (slack) is provided within the cabinet (5m recommended).
As well as being required to facilitate the termination of the cable in the OF patch panel, spare cable will allow for the possibility of re-termination, repair and ability to relocate the panel if required in the future.

NB1. Spare cable may require special stowage requirements in the installation.
NB2. Before termination, always cut off the first metre 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.





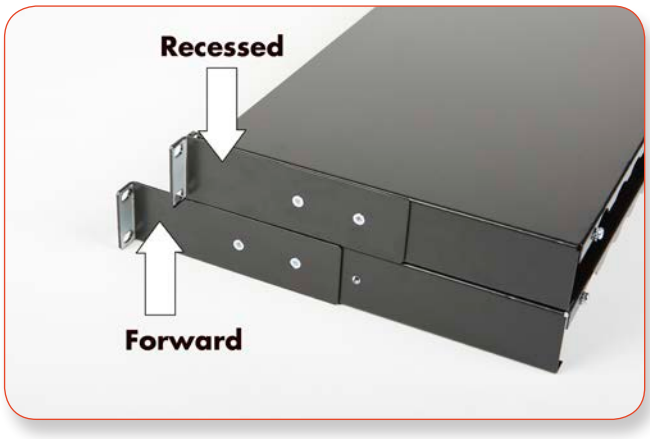
1) Slide the sliding drawer off the chassis (Fixed part) - lift the drawer up to disassembled it from the chassis.

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

3) When reaching the end of the chassis, lift the drawer more and unhook, now both parts are separated.

Phase 1 Preparation of the patch panel

The L-shape brackets of the chassis can be installed forward or recessed. By default, it is installed in the forward position.Change it to the recessed position if needed knowing that the right position is dependant on the available space between the 19" frame and the cabinet door.

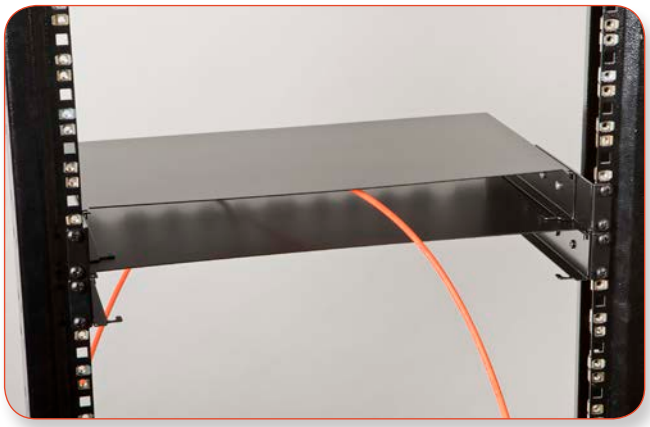


Then, position the chassis into the rack.

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

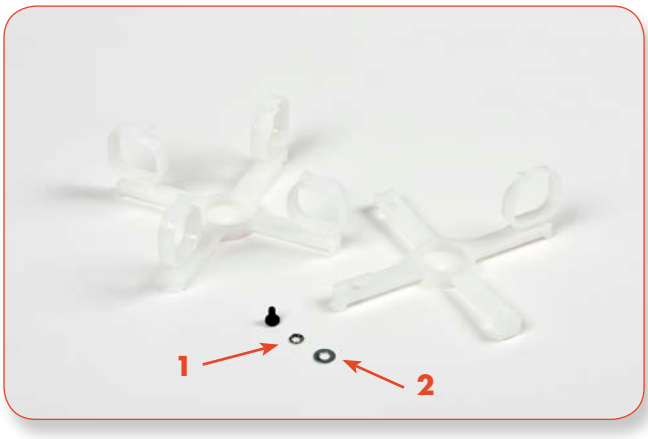
NB. The hole for the screw is located at the rear of the panel on the left hand side of the chassis)

Thread the cable through the chassis of the patch panel.
Make sure to respect the minimum bending radius while handling the cable.

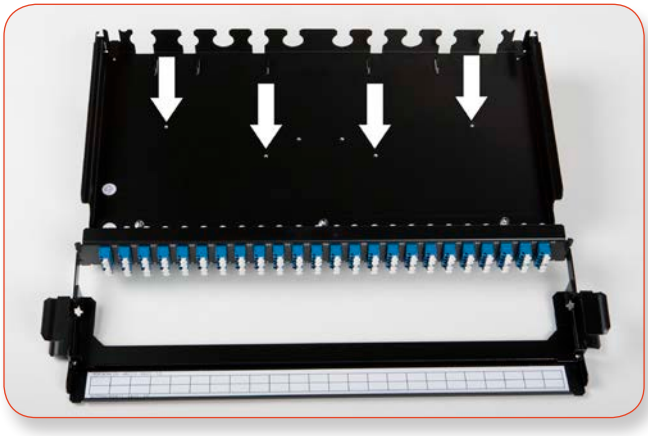


Sliding drawer preparation

For direct termination or pre-term installation: install the 4 support bases using the 4 small screws, washers (both flat (**1**) and locking (**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 to support the fibres.



Arrows indicate loop rings fixing points.



Phase 1 Preparation of the patch panel

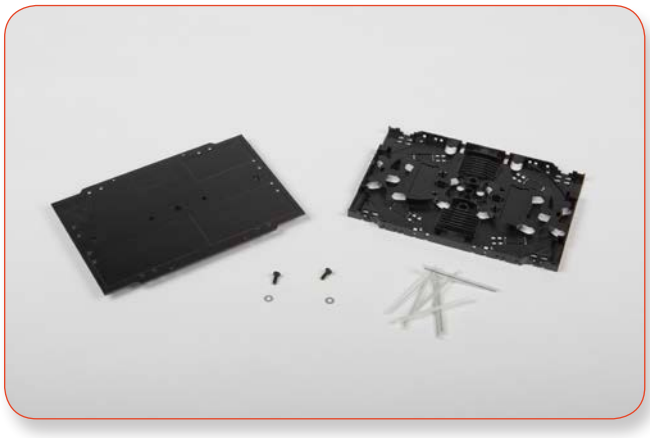
For splicing:
Install the first splice cassette on the drawer using the 2 longer screws and associated locking washers from the screw kit. The additional cassettes will be installed at a later stage. To connect the additional splice cassettes the hinges at the back of the splice cassettes will be used.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

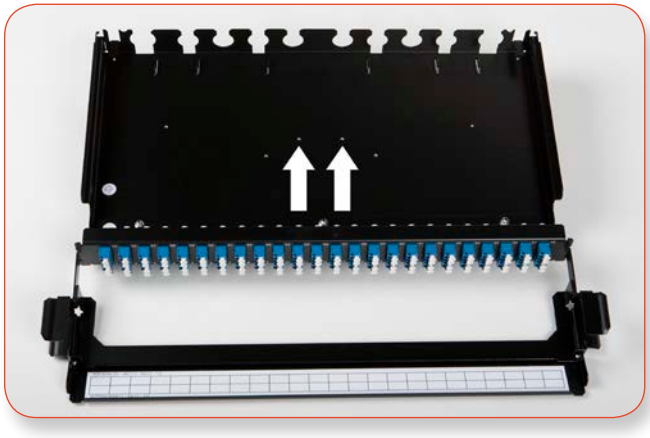
Splice cassettes must be ordered separately.
2 type of splice cassette are available:

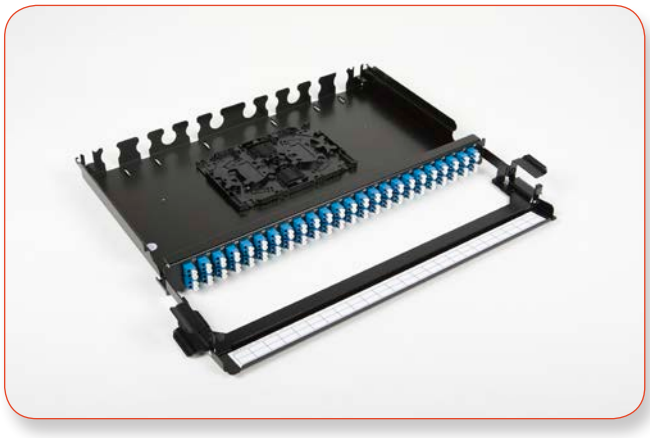
The splice cassette for heat shrink protection (N890.090) can accommodate 12 splices allowing a maximum of 48 splices per patch panel.

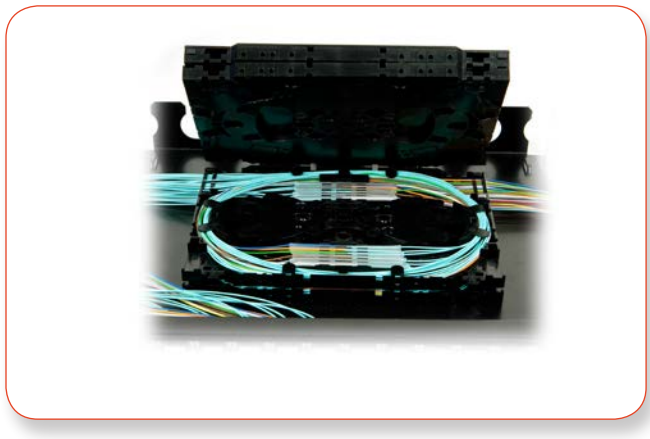
! Heat shrink splice protectors - N890.021 (pack of 100 pieces)

Arrows indicate cassette fixing points.







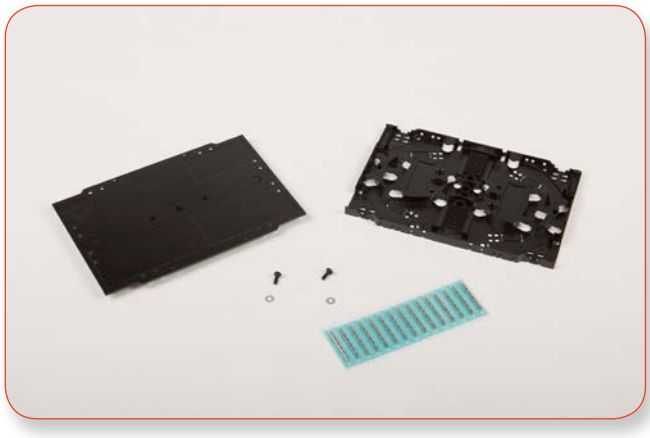


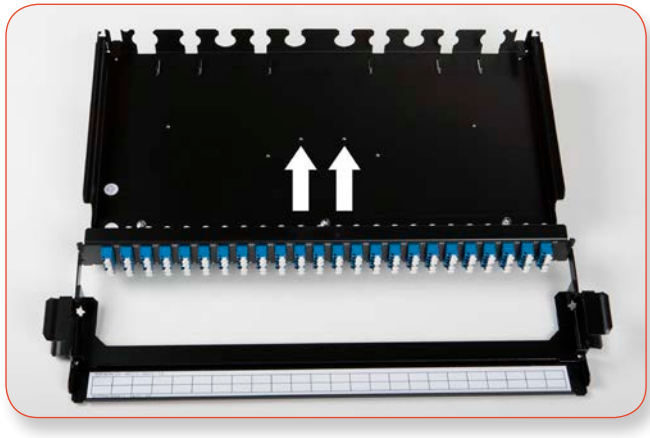
The splice cassette for aluminium protection (N890.091) can accommodate 24 splices allowing a maximum of 96 splices per patch panel.

! Aluminium splice protectors - N890.003 (pack of 150 pieces)

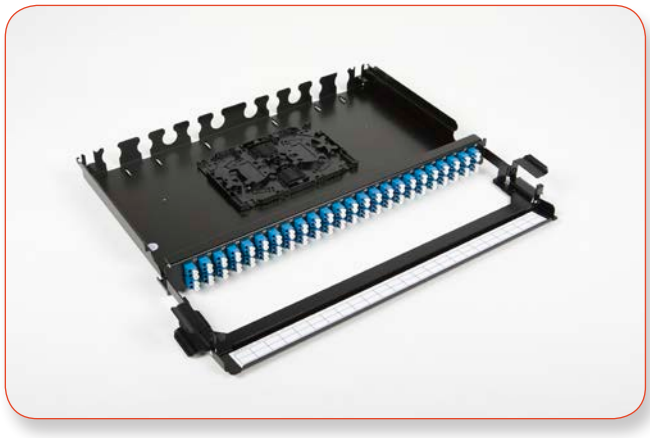
NB. Tool N890.004 must be used with aluminium splice protectors.

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.



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.

Phase 2 Fibre termination

1. Direct termination:

This is suited primarily to Multimode fibres. Direct termination on Singlemode fibres is restricted to specific connector types. (See table below). MTRJ is not recommended for direct termination.

2 Pre-terminated solutions:

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.(see reduced loss and warranty benefits with Nexans pre-term solutions).

3. Splicing:

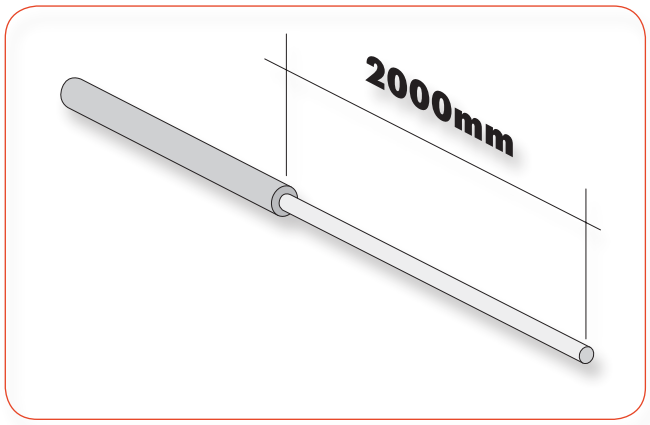
This is suitable for both tight buffered and loose tube constructions, with appropriate use of splice protectors and splice management.

LANmark-OF Microtube P/N: N890.045

Loose tube 250µm fibres	**SC**	**LC**
Fusion Splicing MM	Yes	Yes
Connectorisation MM	Yes, with microtube	Yes with microtube
Fusion Splicing SM	Yes (Preferred)	Yes (Preferred)
Connectorisation SM	with microtube (Available but not preferred)	with microtube (Available but not preferred)

Tight Buffer 900µm fibres	**SC**	**LC**
Fusion Splicing MM	Yes Using Heatshrink splice protectors	Yes Using Heatshrink splice protectors
Connectorisation MM	Yes	Yes
Fusion Splicing SM	Yes (Preferred) using Heatshrink splice protectors	Yes (Preferred) Using Heatshrink splice protectors
Connectorisation SM	Yes (Available but not preferred)	Yes (Available but not preferred)

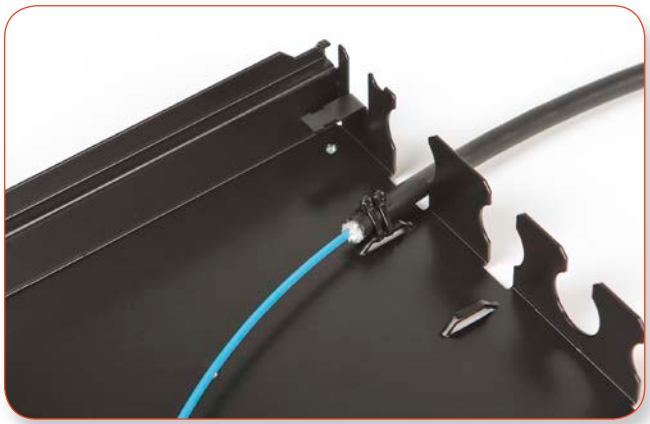
Remove approximately 2 metres of the outer sheath and the aramid/glass yarns from the cable.
Consult specific guidelines on removing the outer jacket depending on the construction.
Special consideration may be required for grounding corrugated metal jacket constructions.
Refer to customer / site installation specifications.



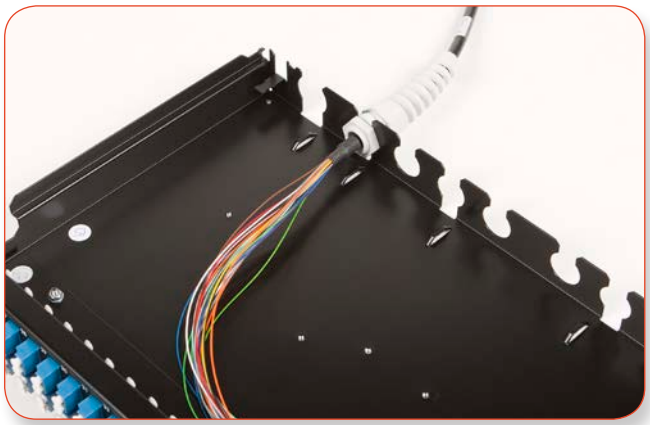
Avoid damaging the fibres while cutting the outer jacket and yarns. Collect all waste and dispose of correctly.
For 250µ fibres the tube must be removed leaving at least two loops in the loop rings. Make sure to clean the fibres (with appropriate and approved cleaning solvents) to remove the gel.

The sliding drawer unit features 2 options for retaining prepared fibre cables.

Using the Tie wraps upstands located near the gland holes



If no tie wraps are used, then an optional cable gland (20mm / PG11-13,5 or 25mm / PG16-21) has to be used to affix the cable to the patch panel.



20mm hole: PG11-13,5

LANmark-OF Cable gland 20mm
N890.147
Suitable for cable diameters 4.3 – 11.9mm

25mm hole: PG16-21

LANmark-OF Cable gland 25mm
N890.146
Suitable for cable diameters 12.3-18mm

Fix a permanent label on the fibre cable for future identification.
Provide at least 2 spare loops of core in the patch panel and locate in the loop rings.

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

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

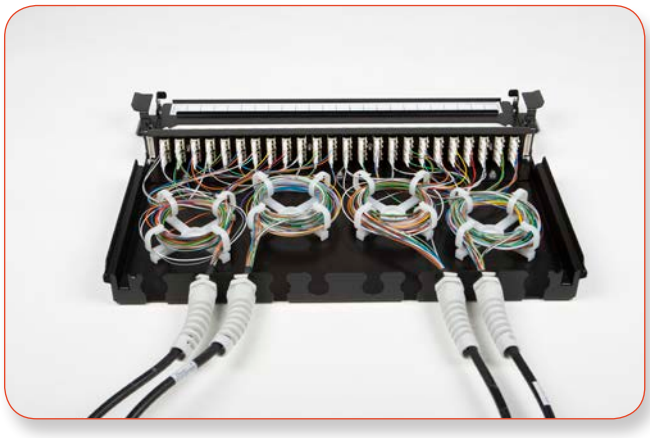
Take the fibre out of the loop rings and mount the connectors on the fibre. When mounting connectors on 250 µ fibre, you will need to use an optional microtube (N890.045) to reduce risk of damaging the fibre.

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

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

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

Continue with Phase 3



Phase 2B Termination with Pre-Terminated assemblies

The gland holes of the panel are open at the top and are therefore suitable for use with Pre-Terminated assemblies.

Insert the cable from the rear end of the panel. Partially remove the protective tube to access the cable gland. Slide and fasten the gland in one of the gland hole and remove the protection tube.

In the case where a pulling system is supplied with the assembly, the tie-wrap upstands provide for this system to be attached. In addition aramid yarns can similarly be fixed on the chassis.

Coil the fibre using loop rings provided with the panel.

Remove the dust protection caps on the inside of the couplers where connectors will be inserted.

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

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

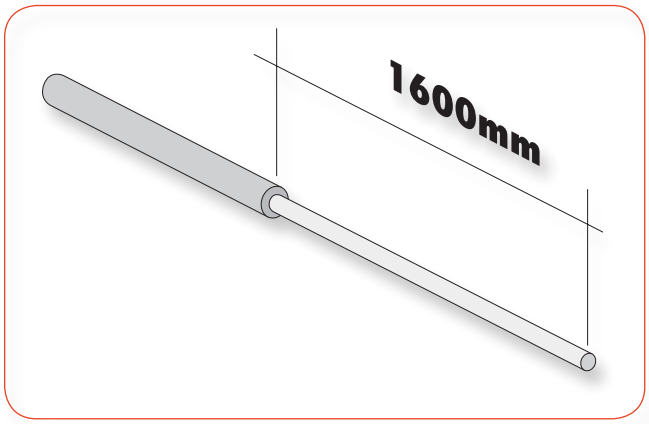
Refer to "Recommendations to maintain OF duplex channel polarity"- a technical paper, which is available from our website under "File Library". Knowledge of this document content will assist in efficient preparation of the cores and storing within the spindle or rings.(see Annex)

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

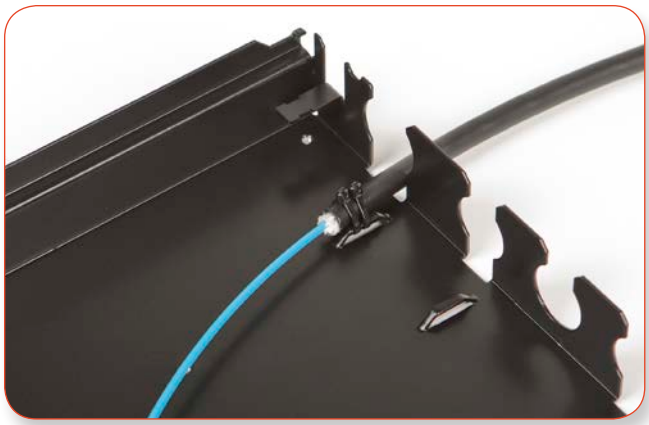
Continue with Phase 3

In case of tight buffer fibre: Strip at least 1.6 meters of cable sheath to allow enough spare fibre for later maintenance purposes. Consult specific guidelines on removing the outer jacket depending on the construction. Avoid damage to the fibres while cutting the outer jacket and yarns.

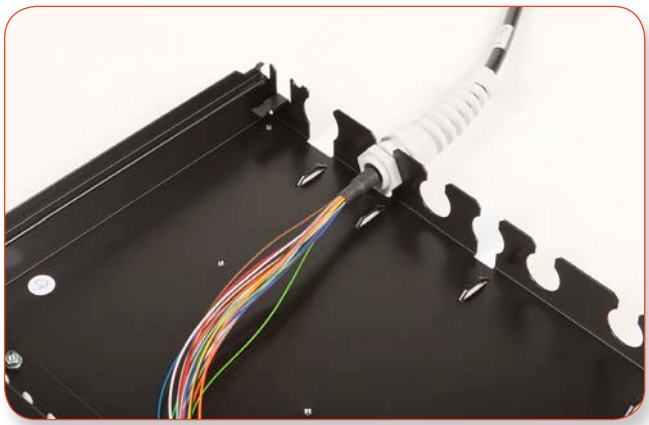
In case of loose tube fibre:
Remove 1.6 meters of outer sheath from the tube(s).
Use the correct tools in order not to damage the fibres while cutting the tube.



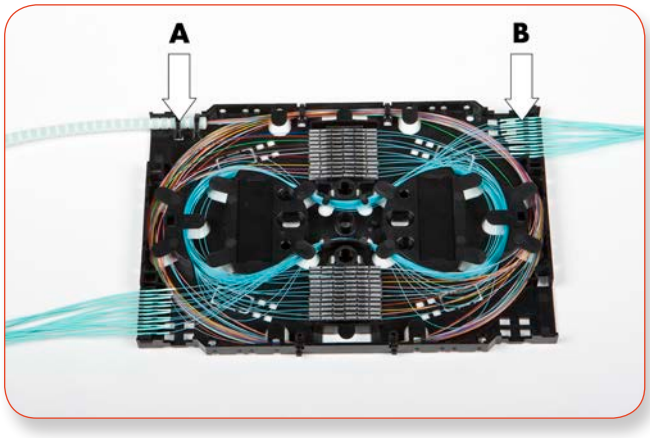
Secure the outer jacket of the cable onto the base at the back of the patch panel by means of tie-wraps. Tighten the tie wraps firmly.



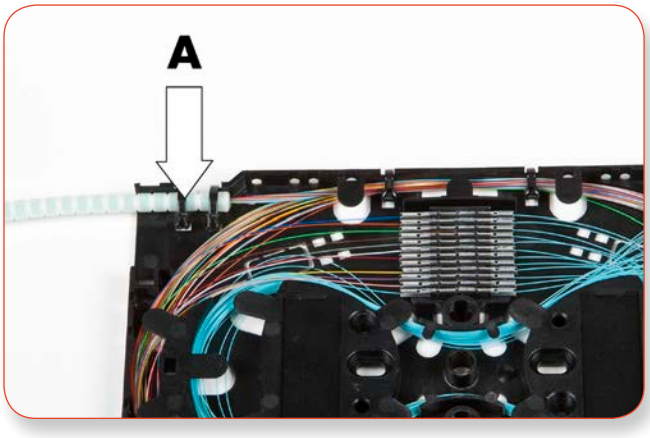
If no tie wraps are used, then an optional cable gland (20mm / PG11-13,5 or 25mm / PG16-21) has to be used to affix the cable to the patch panel.



Fix a permanent label on the fibre jacket for future identification.
Up to 4 splice trays may be installed to hold up to 48 (heat-shrink) or 96 (Metallic) fibre splices.
Splice trays for fibre splice protections are available in metallic or heat-shrink versions.
Refer to Phase 1 chapter for detailed information on splice trays.



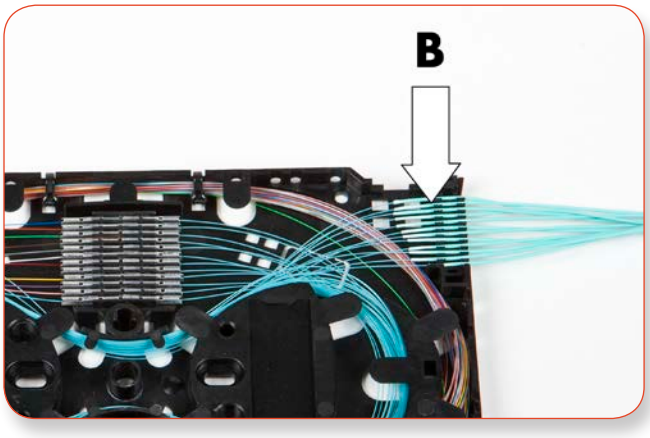
Remove surplus tube from the fibre to allow the remaining tube to be fixed in the splice tray (A) by means of tie wraps. The tie wraps are not intended to provide strain relief but to keep the tube in the right position.
==> Do not over-tighten the tie wraps on the tube especially when working with micro-bundle cab.



Clean the fibres with an approved and suitable solvent to remove the gel.
Make sure to have at least 2 loops of slack fibres in the splice tray. Up to 12 fibres can be installed per heat shrink splice tray and up to 24 splices can be installed using metallic aluminium protectors.
Remove the dustcaps from the couplers on the inside of the Patch Panel.

A check for the cleanliness of the couplers is required.
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.
The fibres from the pigtails should make 2 loops in the opposite direction.
Nexans Maxi strip pigtails allow the removal of the 900µ buffer in one go after being cut to the right length.

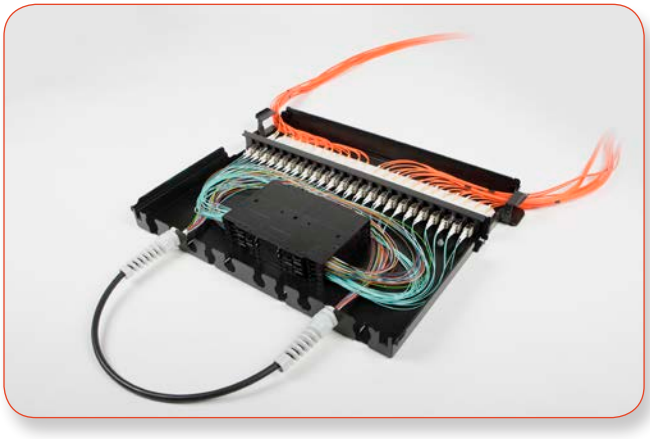


A minimum 2 loops of fibre core from the pigtail is advised in the splice tray.
In case of using a fibre cable with more than 12 x 250µm fibres, an additional splice tray will be required.
Therefore, fibres will need to be routed in a protective sleeve from the first splice tray to the second unit.
This can be achieved by using 20 cm of bend limiting tube connected on the opposite side of where the pigtails enter the splice tray (N890.145).

Cut the first 12 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.

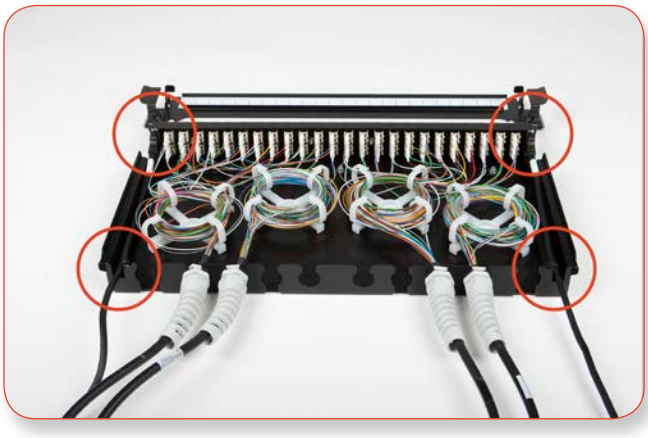
The microbundle loose tube is held in place with tie wraps, it's not advised to tie the tie wraps tightly as they are not used for strain relief.

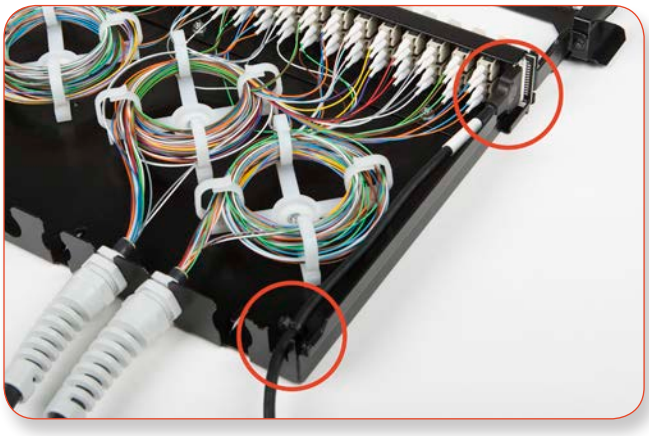
The "Recommendations to maintain duplex OF channel polarity" technical paper, which is available from our NCS website (under the File Library), should be considered when choosing the colour order. (See Annex)



For LANmark panels, continue with Phase 4
For LANsense panels, continue with Phase 3

When terminating a LANsense version of the pre-loaded OF panel, an additional operation is required: installation of the I/O cords.
A female connector is present on both sides of the inner face of the front plate to connect the LANsense integrated strip to the LANsense analyser.
2 I/O cords therefore need to be connected before the panel installation is complete.





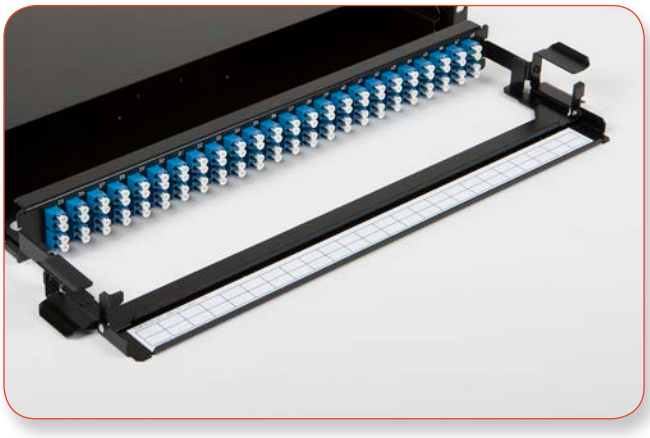
Carefully connect the LANsense I/O cable connector to the connector on the back of the front plate. The connector will only fit one way.

Use a tie-wrap to fix the LANsense I/O cable on the I/O support bracket (One of both side of the panel).

For installation of the self additive label, open the patchguide manager into the horizontal position. Stick the label on the back of the patch cord protector.

Label according today´s network administration standards.

Label the ports conforming to the site labelling scheme.

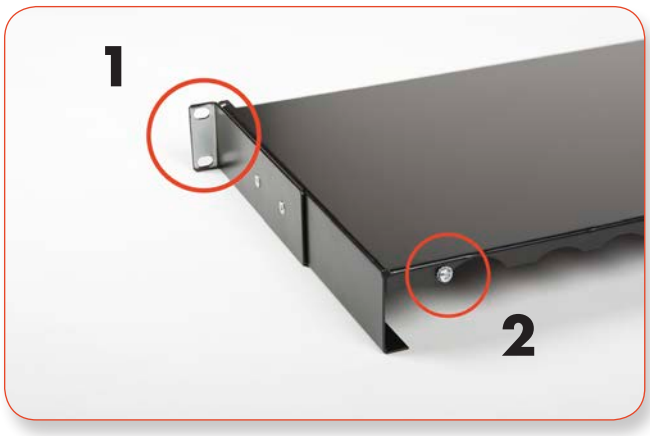


Phase 4 Finalization of the installation

The drawer assembly can now be refitted to the chassis.
Lift-up the drawer to engage it into the chassis.
Then lower the drawer and slide it inside the chassis.

First engage left and right locks into the chassis.

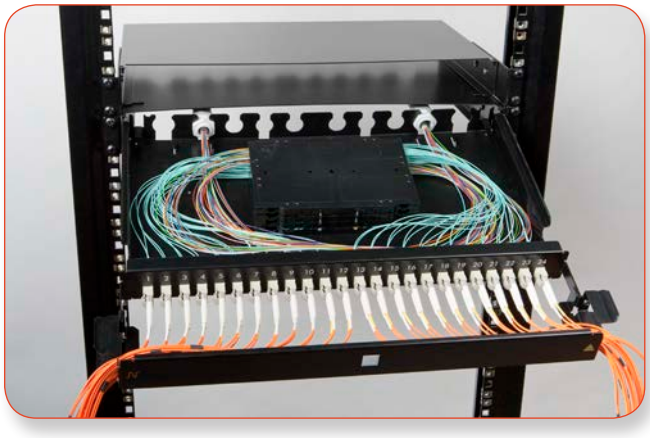
The rear side of the L shape bracket is unpainted to ensure automatic earth connection with Nexans cabinets' frames or other unpainted 19" frames (1).
If the frames are painted, an earth connection has to be made to the chassis using an earth lead. (2)
Spare / slack cable should then be appropriately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



The patch panel installation is now complete.

Testing must now be carried out in accordance with client requirements and Nexans procedures 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.

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 for a fully loaded patch panel (48 fibres)