

#smartconnection



LAN Systems

Data Centres Catalogue

www.aginode.net



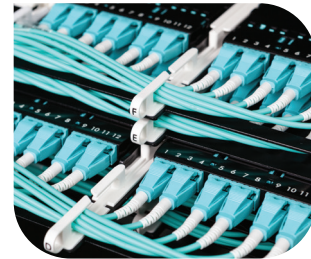
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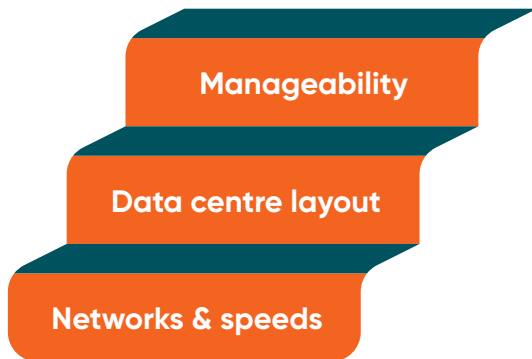
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Smart Choices for Digital Infrastructure



Three steps to empower your data centre

Our world is becoming increasingly mobile, digital and smart. With our growing dependence on digital services and the explosion of artificial intelligence, traffic is intensifying in our data centres. The biggest jump has been in east-west traffic within the data centre, on top of continued growth in north-south traffic from the data centre to the user.

Supporting these explosive rates of digital growth requires an agile, carefully planned IT infrastructure, and efficient data access and exchange. Cabling systems need to be robust, flexible and scalable,

designed to support business growth and technological evolutions.

Aginode can help you build and operate an efficient and cost-effective digital infrastructure that will help you reach your business goals.

We focus on three key area :

1. Networks and speeds

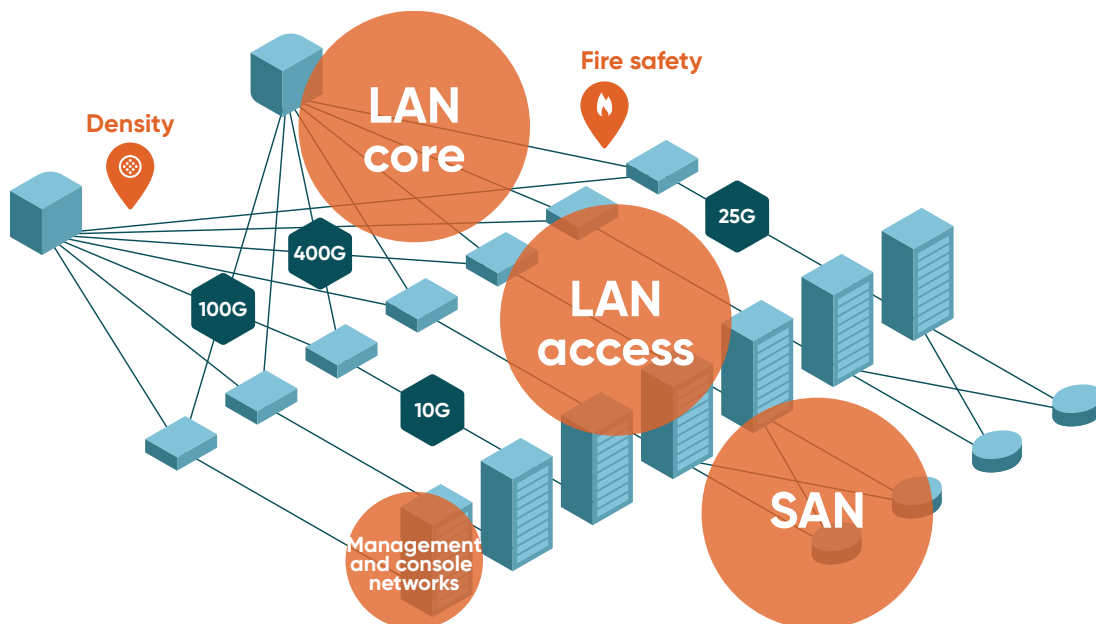
Exploring new standards, the evolution from server to switch, and migration scenarios.

2. Data centre layout

What to consider when designing your data centre.

3. Manageability

Smart choices to reduce installation times and space usage, increasing flexibility in use and improving your total cost of ownership.



1. Networks & speeds

Staying up to date on technology trends and emerging standards is the key to knowing which way to turn, and when.

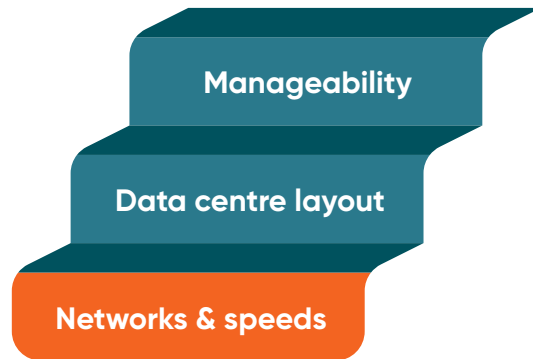
Choosing which standards to follow has become more complicated. In the past, IEEE high speed protocols were developed well in advance of general use, ahead of market needs. Deciding which speed to work towards was simple: follow the IEC/ISO and TIA standards.

Today, there's a complex landscape of solutions to choose from, including many that operate outside IEEE and other trusted standards bodies. Switch vendors have introduced solutions for 100 Gigabit or 400Gigabit, which are more complex compared to the previous generation. These solutions not only adhere to IEEE standards but also incorporate technologies and specifications from Multi-Source Agreements (MSAs) that have been reached among various industry alliances. And some industry alliances have formed multisource (MSA) agreements.

Aginode can help you to navigate your way through the technology roadmap.

Smart choices for the Core networks

When designing the LAN core, known as a spine network, which will probably one day need a data rate of 800Gbit/s or even 1.6Tbit/s, a choice has to be made between parallel optics or duplex LC. The advantage of Aginode's MPO solutions is its support



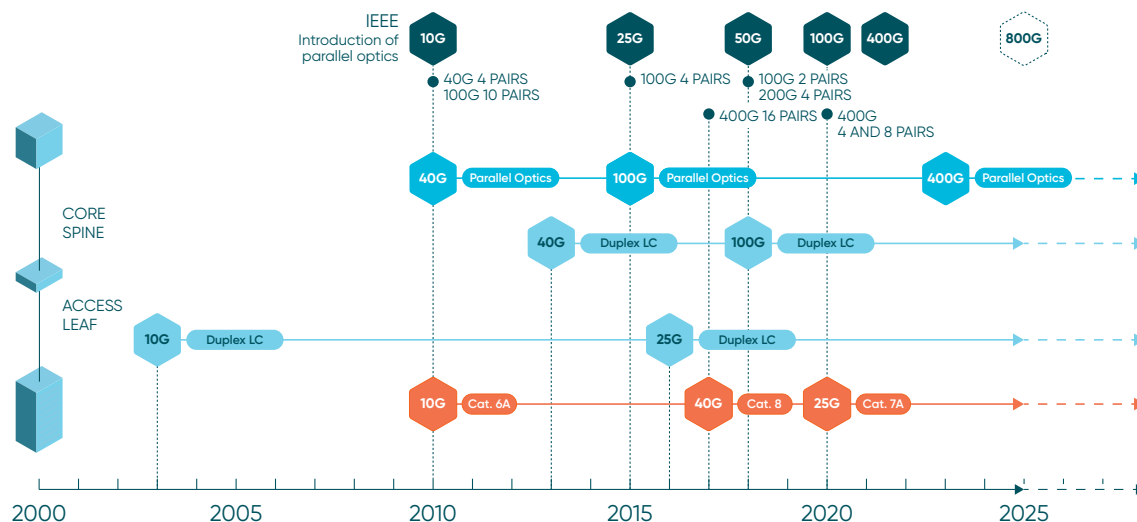
for 100, 400 and 800 Gigabit with 8 fibre. This MPO solution will give you at least three generations of evolution within your data centre. Using the same cabling for 3 generations lowers installation costs and reduces investment.

You can find our parallel optics solutions on pages 15, 24, 29 and 30.

Our duplex LC solutions you can find on pages 14,16, 17-19, 23 and 28

Smart choices for the Access network

Both speeds of 10G as 25G can be supported with fibre in duplex LC as with copper. Our copper solutions, including our innovative LANmark-7A with GG45 to support 25G, can be found on pages 42-64.



2. Data centre layout

In addition to helping you choose the right standards and technology for your networks and speeds, Aginode can support you in making smart choices for your data centre layout.

Things to consider when designing your data centre:

- What cable lengths you need to meet the physical dimensions of your data centre ?
- Do you have certain space constraints ?
- What are the fire safety and other challenges ?

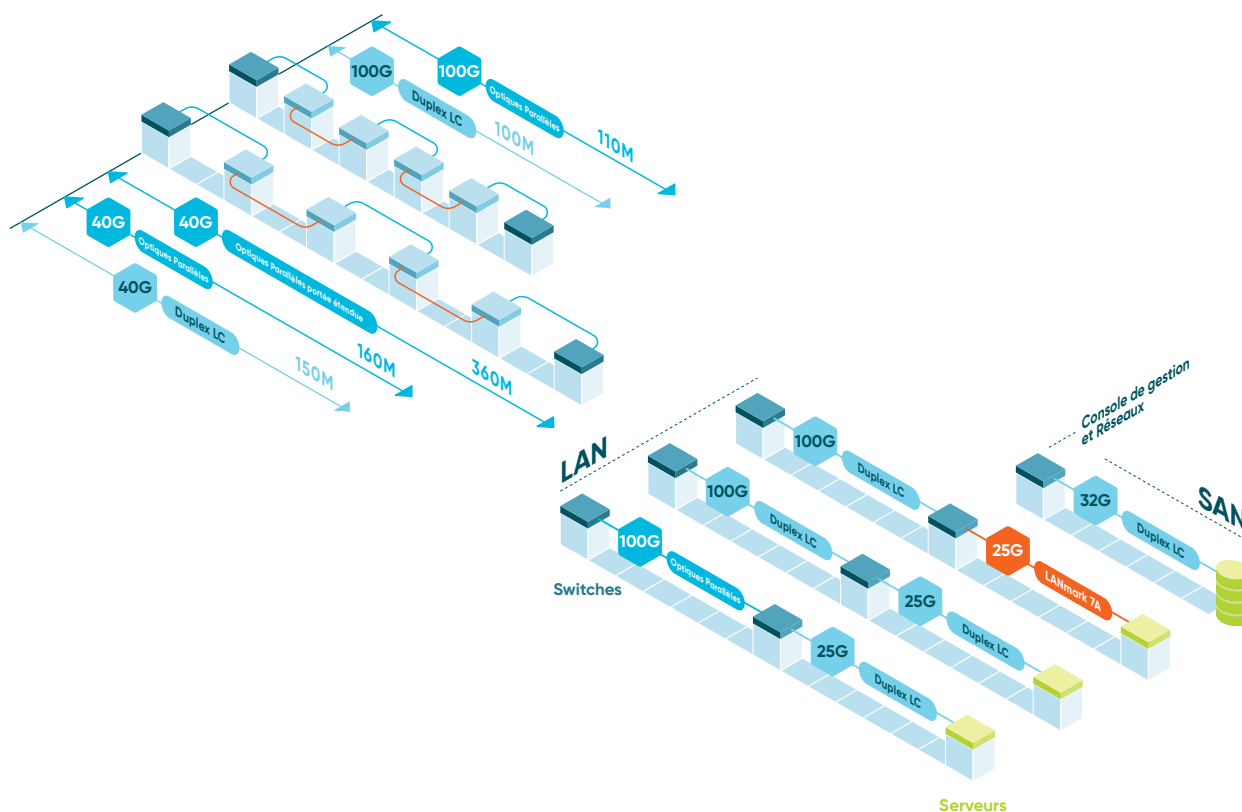
LANmark cabling systems allow you to optimally balance copper and fibre, in line with the performance you need, for any number of ports and any bandwidth.

Manageability

Data centre layout

Networks & speeds

Aginode connectivity solutions exceed the requirements of all relevant standards, ensuring that data centres perform better and more reliably. You can find more details on guaranteed distances with Aginode fibre solutions on pages 32-37.



3. Manageability

Aginode can support you in making smart choices to make your network more manageable:

- Easy identification features dedicated fibre trunking systems
- LANSense physical layer automated documentation
- Choosing a patching solution with the density you need

Patching is clearly one of the most significant areas a data centre manager has to deal with on a daily basis. Aginode provides 3 different density levels in its fibre offering – see p10-20. Its ENSPACE Ultra high density solution can support 144 LC connections in 1U.

Manageability

Data centre layout

Networks & speeds

And two levels on with copper solutions – see p41-42. Its Slimflex high density patch cord with high density patch panel can support 48 RJ45 cords in 1U.

Coloured shutters and latch protectors can be used to differentiate networks/protocols and/or redundancy path. See p55.



LANmark™

Fibre solutions

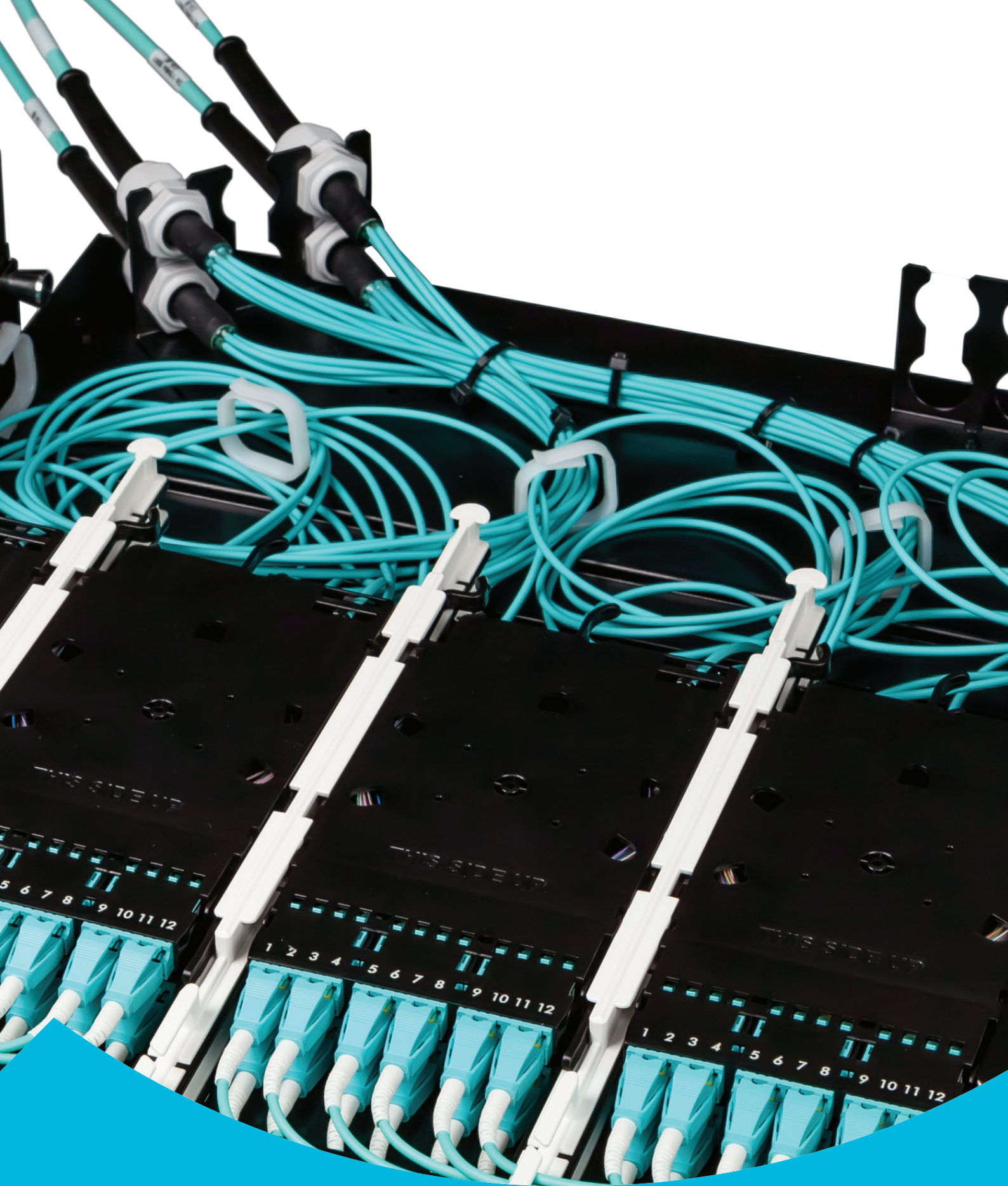


**More
data**



**Less
space**





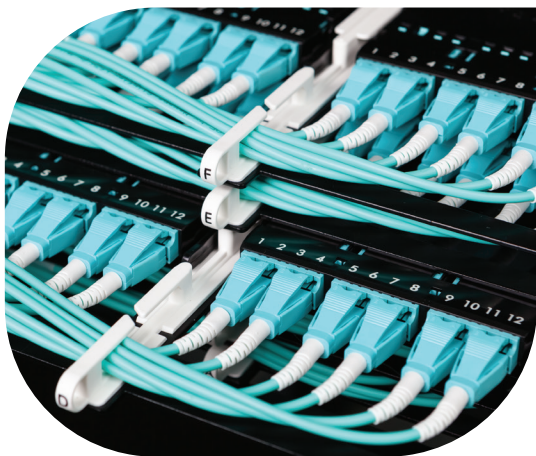
LANmark-OF ENSPACE



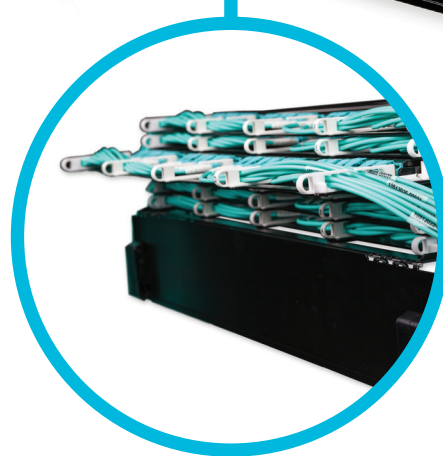
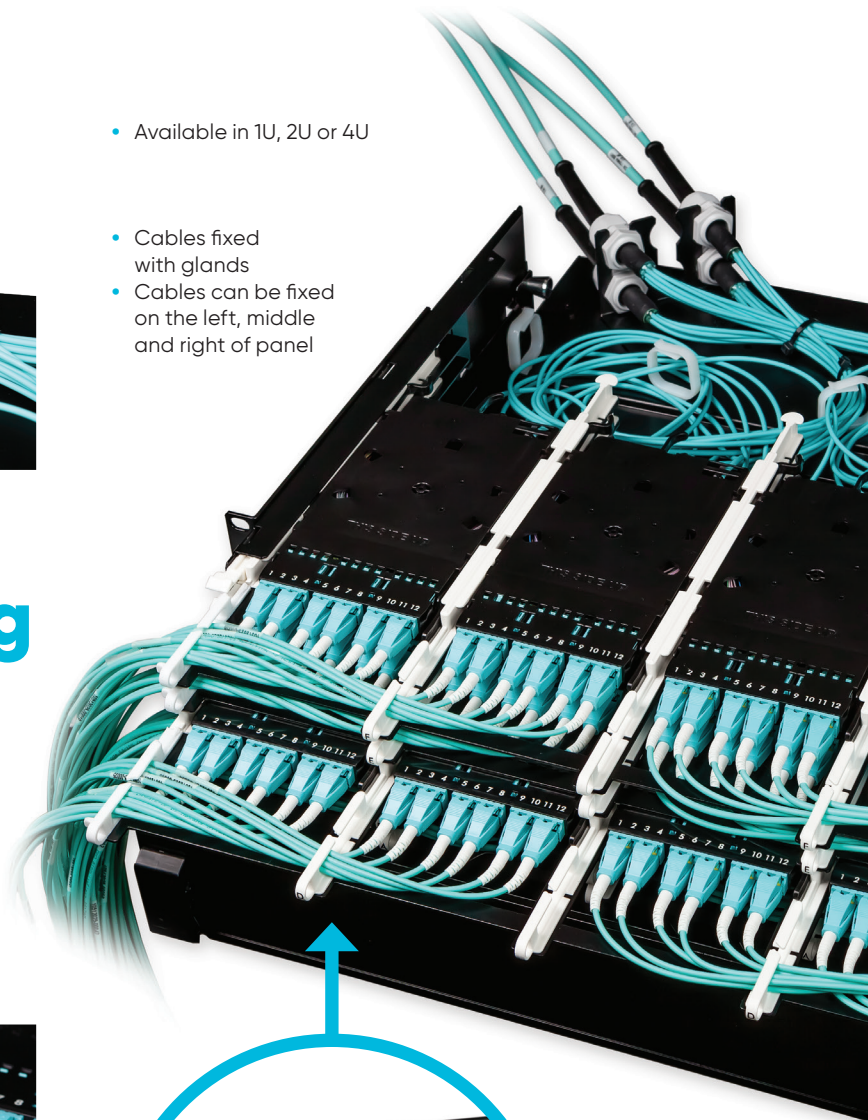
- Available in 1U, 2U or 4U

- Cables fixed with glands
- Cables can be fixed on the left, middle and right of panel

Easy patching and flexible scalability



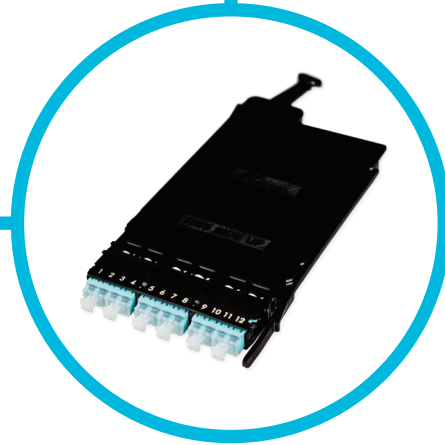
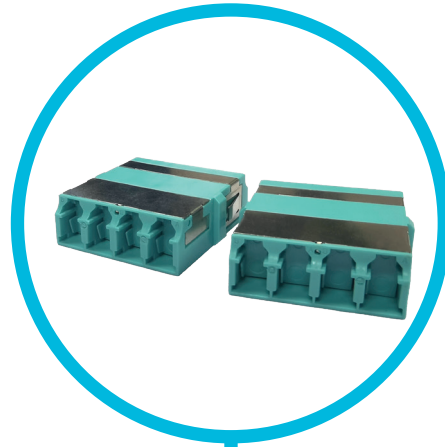
- Fingertip access to patch cords
- Individual sliding tray with 4 modules
- Locking positions when installed, for patching and before removal



- Opens 180° even with panels below

- Sliding and tilting rear drawer

- Internal auto-shutter
- Improved eye safety



- Can be installed from front and rear
- 12x LC or 6x MPO



- Patch cord 2mm diameter
- Uniboot connector
- Bend Insensitive Fibre



- Integrated patch cord guide
- Side grips for easy tray removal

LANmark-OF ENSPACE UHD patch panels

- Optical patch panel with Ultra High Density: up to 144x LC or 72x MPO in a rack height unit
- Up to 12x ENSPACE modules in 1U height
- 3 individually sliding trays per 1U for maximum flexibility during operation and installation
- 3 different locking positions for trays: operational, patching and installation position
- Patch cord management for each individual tray
- Labelling front for port identification
- Labelling front opens almost 180°: Port identification visible even when the panel is high in rack
- Sliding and tilting tray at the rear of the panel for better access to cables during initial installation and additions
- Optimised for installation of LANmark-OF ENSPACE Pre-Term with cable glands



Ultra
high
density



12
modules



144
LC



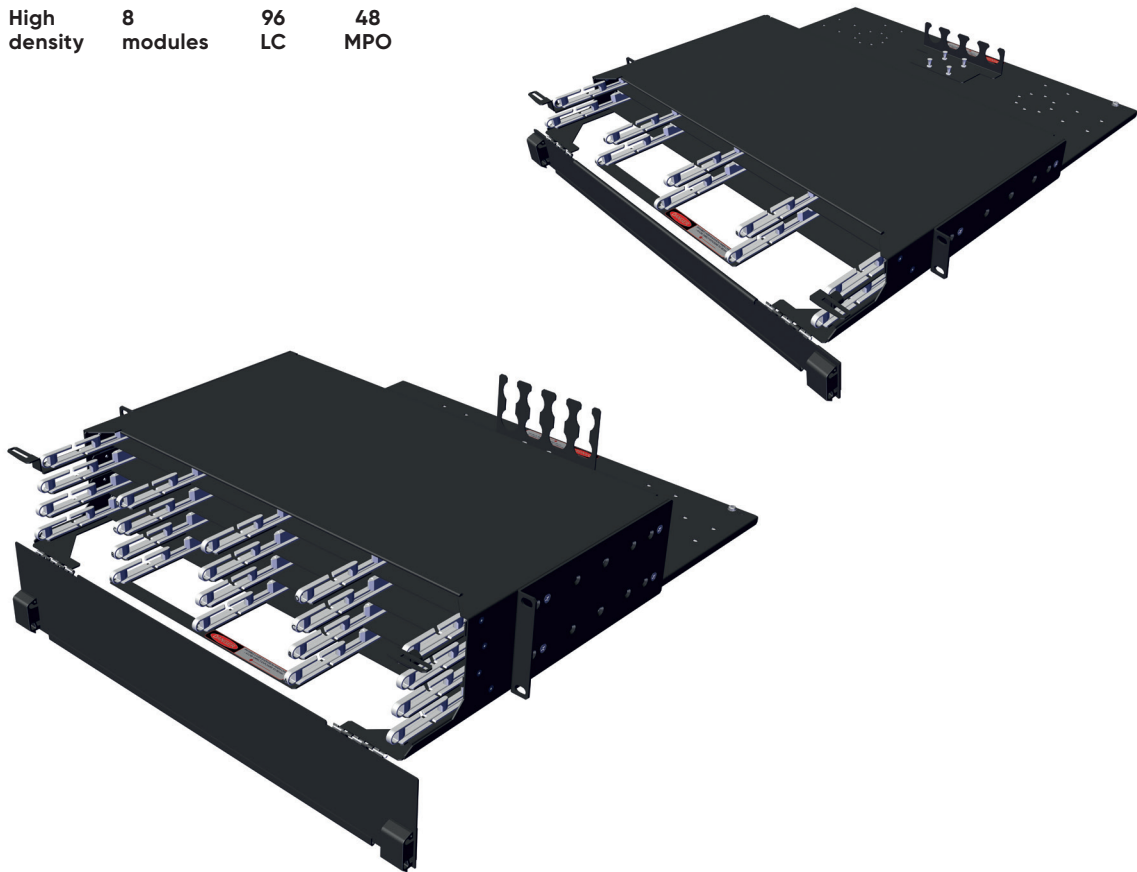
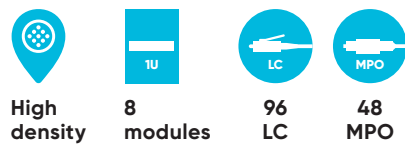
72
MPO



Reference	Description	Height unit	Modules	DLC adaptors / 10G ports	MTP adaptors / 40G/100G ports
NSPACE.PP1U	LANmark-OF ENSPACE UHD Patch Panel 1U 12x Modules Black	1U	12	72	72
NSPACE.PP2U	LANmark-OF ENSPACE UHD Patch Panel 2U 24x Modules Black	2U	24	144	144
NSPACE.PP4U	LANmark-OF ENSPACE UHD Patch Panel 4U 48x Modules Black	4U	48	288	288

LANmark-OF ENSPACE HD patch panels

- Optical patch panel with High Density: up to 96x LC or 48x MPO in one rack height unit
- Up to 8x ENSPACE modules in 1U
- 2 fixed module rows, each with 4 slots for ENSPACE modules
- No sliding parts for assured reliability during maintenance
- Integrated Patch cord management for each module row
- Swinging front door that accommodates a slide-in label for port identification. Labelling front for port identification with label that could be slit in
- Labeled front door opens almost 180°: Port identification visible even when the panel is high in the rack
- Optimised for installation of LANmark-OF ENSPACE Pre-Term with cable glands



Reference	Description	Height unit	Modules	DLC adaptors / 10G ports	MTP adaptors / 40G/100G ports
NSPACE.PPHD1U	LANmark-OF ENSPACE HD Patch Panel 1U 12x Modules Black 1U	1U	8	48	48
NSPACE.PPHD2U	LANmark-OF ENSPACE HD Patch Panel 2U 16x Modules Black 2U	2U	16	96	96

LANmark-OF ENSPACE LC Adaptor Modules

- ENSPACE module with 12x LC adaptors in the front
- Module can be easily mounted into Aginode' ENSPACE patch panel
- Modules can be installed from front and rear of panel
- Innovative handle at rear facilitates removal and installation
- Integrated inner metal shutters
- Optimised for installation with ENSPACE LC/LC Pre-Term
- Integrated strip with color coding for quick fibre identification during installation
- Splice holders with heat shrink or Aluminum splice protectors are included as accessories



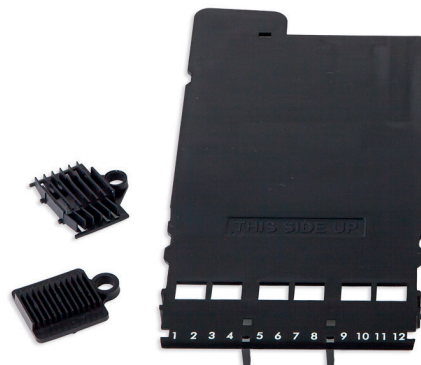
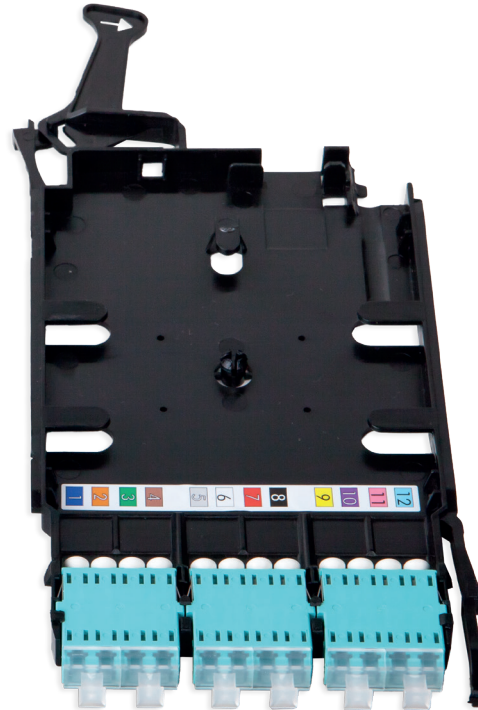
High
density



12
LC



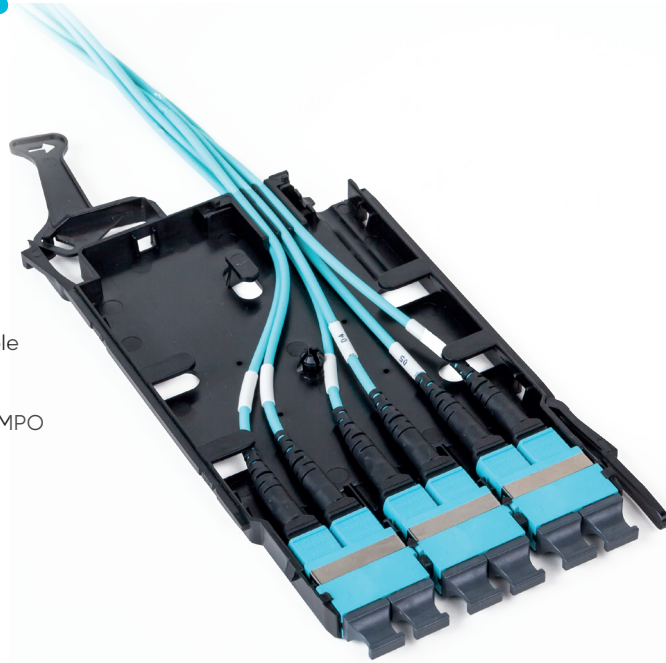
OM4
OM5
OS2



Reference	Description
NSPACE.PLC12AS	LANmark-OF ENSPACE LC Adaptor Cassette 12 LC, Multimode, Aqua
NSPACE.PLC12LS	LANmark-OF ENSPACE LC Adaptor Cassette 12 LC, Multimode, OM5, Lime Green
NSPACE.PLC12BS	LANmark-OF ENSPACE LC Adaptor Cassette 12 LC, Singlemode, Blue
NSPACE.PLC12GS	LANmark-OF ENSPACE LC Adaptor Cassette 12 LC/APC, Singlemode, Green

LANmark-OF ENSPACE MPO Adaptor Modules

- ENSPACE module with MPO adaptors in the front for parallel optics
- Module can be easily mounted into Aginode' ENSPACE patch panel
- Modules can be installed from front and rear of panel
- Innovative handle at rear facilitates removal and installation
- Optimised for installation with ENSPACE MPO/MPO Pre-Term
- Key up/key down and key up/key up available
- Integrated strip for quick port identification during installation
- Available density: 2 x MPO, 4 x MPO and 6 x MPO



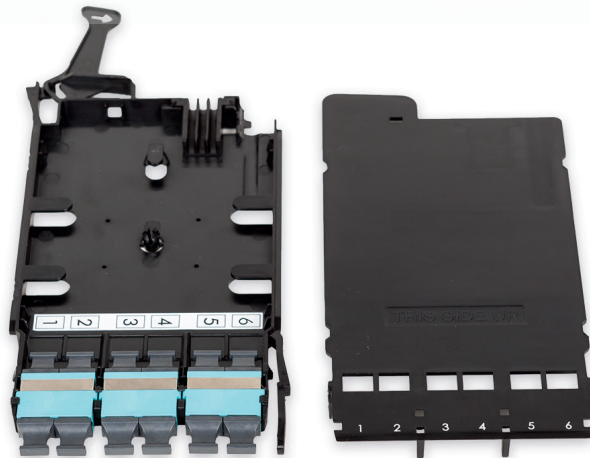
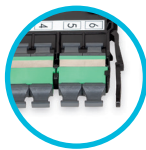
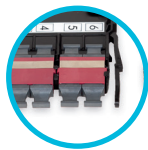
High density



2 x MPO
4 x MPO
6 x MPO



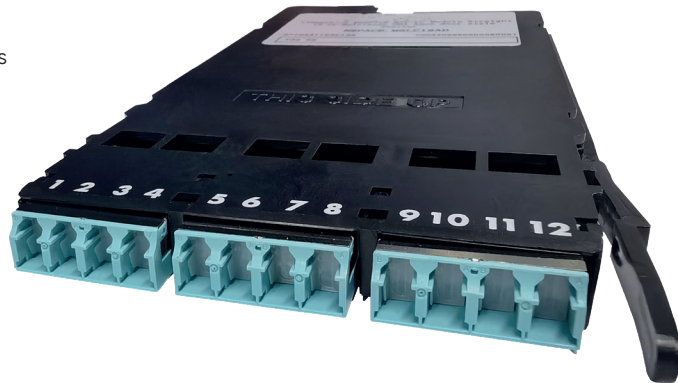
OM4
SM



Reference	Description
NSPACE.PMTP2U	LANmark-OF ENSPACE MTP Adaptor Cassette, 2xMTP Multimode, Key up-Key up, Grey
NSPACE.PMTP4U	LANmark-OF ENSPACE MTP Adaptor Cassette, 4xMTP Multimode, Key up-Key up, Grey
NSPACE.PMTP6U	LANmark-OF ENSPACE MTP Adaptor Cassette, 6xMTP Multimode, Key up-Key up, Grey
NSPACE.PMTP2A	LANmark-OF ENSPACE MTP Adaptor Cassette, 2xMTP Multimode, Key up-Key down, Aqua
NSPACE.PMTP4A	LANmark-OF ENSPACE MTP Adaptor Cassette, 4xMTP Multimode, Key up-Key down, Aqua
NSPACE.PMTP6A	LANmark-OF ENSPACE MTP Adaptor Cassette, 6xMTP Multimode, Key up-Key down, Aqua
NSPACE.PMTP2G	LANmark-OF ENSPACE MTP Adaptor Cassette, 2xMTP Singlemode, Key up-Key down, Green
NSPACE.PMTP4G	LANmark-OF ENSPACE MTP Adaptor Cassette, 4xMTP Singlemode, Key up-Key down, Green
NSPACE.PMTP6G	LANmark-OF ENSPACE MTP Adaptor Cassette, 6xMTP Singlemode, Key up-Key down, Green

LANmark-OF ENSPACE MPO-LC Adaptor Modules

- ENSPACE module with 12x LC adaptors in the front and 1 MPO adaptor in the rear
- Ultra low loss performance for multimode: 0,35 dB insertion loss per module
- Low low loss performance for singlemode: 0,5 dB insertion loss per module
- specially designed internal LC dust shutters that prevent contact with the ferrule
- Modules can be installed from front and rear of panel
- Innovative handle at rear facilitates removal and installation
- Modules available with universal polarity
- Unpinned/female MPO connector inside module
- ENSPACE modules are pre-installed and 100 % factory tested



High
density



12
LC



OM4
OM5
SM OS2



universal
polarity

Reference	Description
NSPACE.MSLC12AS	LANmark-OF ENSPACE MTP Fibre Cassette 12 LC, Straight Multimode, OM4, Aqua
NSPACE.MCLC12AS	LANmark-OF ENSPACE MTP Fibre Cassette 12 LC, Crossed Multimode, OM4, Aqua
NSPACE.MULC12AS	LANmark-OF ENSPACE MTP Fibre Cassette 12 LC, Universal Polarity Multimode, OM4, Aqua
NSPACE.MSLC12LS	LANmark-OF ENSPACE MTP Fibre Cassette 12 LC, Straight Multimode, OM5, Lime Green
NSPACE.MCLC12LS	LANmark-OF ENSPACE MTP Fibre Cassette 12 LC, Crossed Multimode, OM5, Lime Green
NSPACE.MULC12LS	LANmark-OF ENSPACE MTP Fibre Cassette 12 LC, Universal Polarity Multimode, OM5, Lime Green
NSPACE.MSLC12BS	LANmark-OF ENSPACE MTP Fibre Cassette 12 LC, Straight Singlemode, OS2, Blue
NSPACE.MCLC12BS	LANmark-OF ENSPACE MTP Fibre Cassette 12 LC, Crossed Singlemode, OS2, Blue
NSPACE.MULC12BS	LANmark-OF ENSPACE MTP Fibre Cassette 12 LC, Universal Polarity Singlemode, OS2, Blue

LANmark-OF Plug&Play Panel

- High density patch panel: up to 96 LC depending on module type
- Up to 4 Plug&Play adaptor plates
- Sliding and tilting patch panel for ease of installation, upgrade and maintenance
- Labelling front for port identification and patch cord management



High
density



96
LC



Installation with Plug&Play Adaptor Plates and LC/LC Pre-Terms

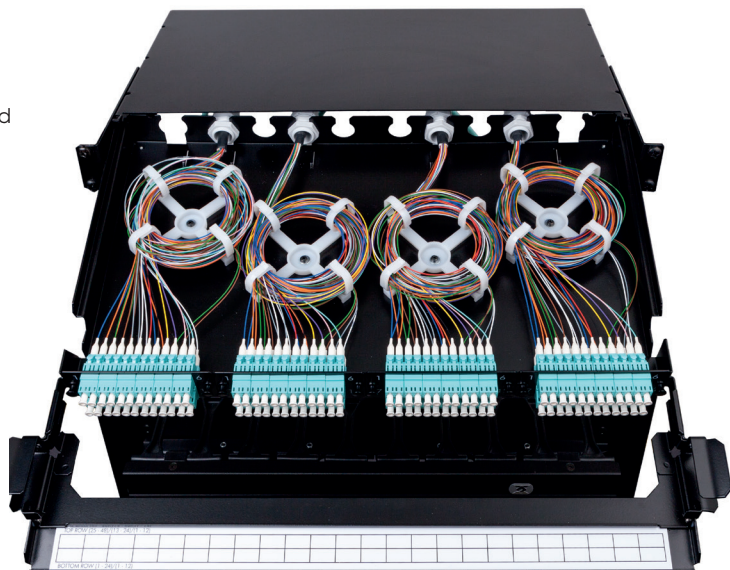
- Fibre organisers as accessory included for fibre management inside patch panel in 4 different loops
- High density: up to 96 LC



High
density

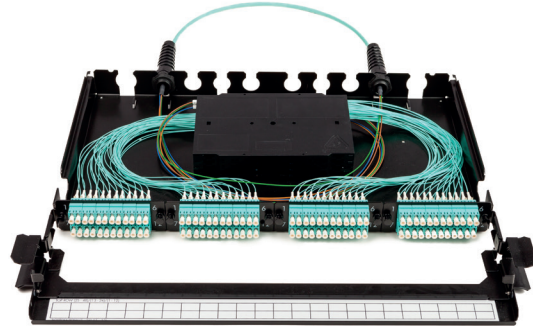


96
LC



Optimised for splicing with Plug&Play Adaptor Plates and Pigtails

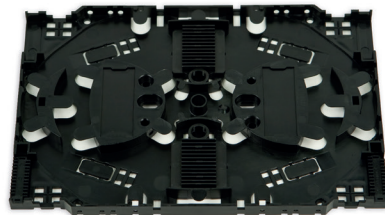
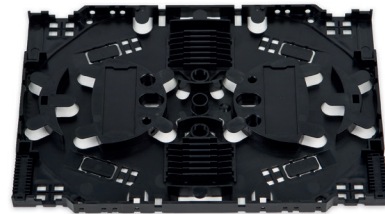
- Up to 4 splice cassettes and 1 cover
- Large splice cassettes for improved fibre management inside cassettes
- Cassettes can be lifted and tilted
- Up to 48 fibres with heat shrink protectors and Tight Buffer pigtails
- Up to 96 fibres with heat shrink protectors and Maxistrip pigtails
- Up to 96 fibres with mechanical/ aluminum protection



**High
density**

Splice Cassettes

- Splice cassettes for Plug&Play panels
- Large cassettes with inner and outer routing for fibres of pigtails and cables
- Cassettes for heat shrink protectors with 12 slots, 2 heat shrink protectors could be stacked in same slot
- Cassettes for Aluminum protectors with 2 x 12 slots
- Only one cover per patch panel

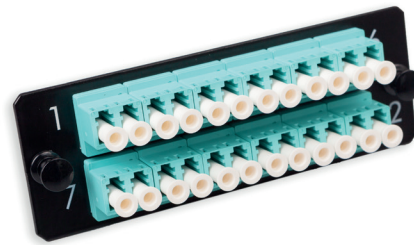
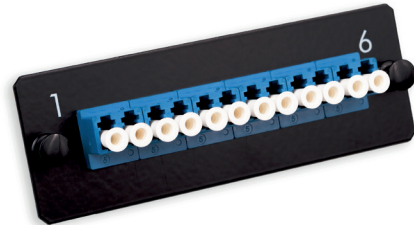
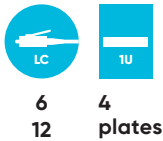


**High
density**

Reference	Description
N439.3MPP	LANmark-OF Plug&Play Patch Panel Integrated Cord Guide Sliding Black
N890.090	LANmark-OF Splice Cassette Heat Shrink Protectors
N890.091	LANmark-OF Splice Cassette Aluminum Protectors
N890.092	LANmark-OF Splice Cassette Cover

LANmark-OF Plug&Play LC Adaptor Plates

- Adaptor plates for 6DLC or 12DLC
- Available in multimode, singlemode and singlemode APC
- Module can be easily mounted into Aginode's Plug&Play patch panel
- High density: 4 plates fit into 1U
- Can be used together with SC/LC Pre-Term or cables terminated with splicing



Reference	Description
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 Singlemode APC Green
N205.ALC24SAG	LANmark-OF Adaptor Plate 24 LC Singlemode APC Green

Module Plug&Play LANmark-OF MPO

- Plug&Play modules with 12LC or 24LC
- Up to 4 modules fit into 1U
- High density: up to 96LC within 1U
- Available with low loss LANmark-OF Plug&Play connectivity for multimode and singlemode
- Module can be easily mounted into LANmark Plug&Play patch panel from the front
- Plug&Play modules are pre-installed and 100 % factory tested
- Female MPO-connector inside module
- Compatible with LANmark-OF ENSPACE male MPO-MPO Pre-Term



High
density



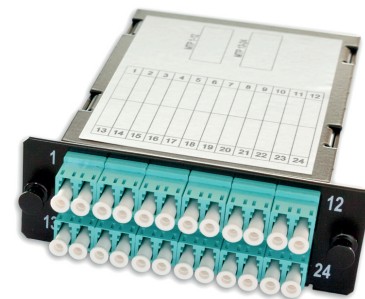
12
24



4
modules



96
LC



Reference	Description
N441.5L12LC4FS	LANmark-OF MPO Plug&Play- Module ultra low loss 12 LC Multimode Aqua Female straight
N441.5L12LC0FS	LANmark-OF MPO Plug&Play -Module ultra low loss 12 LC Singlemode OS2 Blue Female straight
N441.5L12LC4FC	LANmark-OF MPO Plug&Play- Module ultra low loss 12 LC Multimode Aqua Female cross
N441.5L12LC0FC	LANmark-OF MPO Plug&Play -Module ultra low loss 12 LC Singlemode OS2 Blue Female cross
N441.5L12LC4FU	LANmark-OF MPO Cassette ultra low loss 12 LC Multimode OS2 Aqua green Female universal polarity
N441.5L12LC0FU	LANmark-OF MPO Cassette ultra low loss 12 LC Singlemode OS2 Blue Female universal polarity
N441.5M12LC4FS	LANmark-OF MPO Plug&Play- Module low loss 12 LC Multimode Aqua Female straight
N441.5M12LC0FS	LANmark-OF MPO Plug&Play -Module low loss 12 LC Singlemode OS2 Blue Female straight
N441.5M12LC4FC	LANmark-OF MPO Plug&Play- Module low loss 12 LC Multimode Aqua Female cross
N441.5M12LC0FC	LANmark-OF MPO Plug&Play- Module low loss 12 LC Multimode OS2 Blue Female cross
N441.5L24LC4FU	LANmark-OF MPO Cassette low loss 12 LC Multimode OS2 Aqua green Female universal polarity
N441.5L24LC0FU	LANmark-OF MPO Cassette low loss 12 LC Singlemode OS2 Blue Female universal polarit
N441.5M24LC4FS	LANmark-OF MPO Cassette ultra low loss 24 LC Multimode Aqua green Female straight
N441.5L24LC0FS	LANmark-OF MPO Plug&Play- Module ultra low loss 24 LC Singlemode Blue Female straight
N441.5L24LC4FC	LANmark-OF MPO Plug&Play- Module ultra low loss 24 LC Multimode Aqua Female cross
N441.5L24LC0FC	LANmark-OF MPO Plug&Play- Module ultra low loss 24 LC Singlemode Blue Female cross
N441.5L24LC4FU	LANmark-OF MPO Cassette ultra low loss 24 LC Multimode Aqua green Female universal polarity
N441.5L24LC0FU	LANmark-OF MPO Cassette ultra low loss 24 LC Singlemode Blue Female universal polarity
N441.5M24LC4FS	LANmark-OF MPO Plug&Play- Module low loss 24 LC Multimode Aqua Female straight
N441.5M24LC0FS	LANmark-OF MPO Plug&Play- Module low loss 24 LC Singlemode Blue Female straight
N441.5M24LC4FC	LANmark-OF MPO Plug&Play- Module low loss 24 LC Multimode Aqua Female cross
N441.5M24LC0FC	LANmark-OF MPO Plug&Play- Module low loss 24 LC Singlemode Blue Female cross
N441.5M24LC4FU	LANmark-OF MPO Cassette low loss 24 LC Multimode Aqua green Female universal polarity
N441.5M24LC0FU	LANmark-OF MPO Cassette low loss 24 LC Singlemode Blue Female universal polarity

LANmark-OF ENSPACE Pre-Term cable

LANmark-OF ENSPACE Pre-Term cable

- Cable Pre-Term based on advanced Micro-Bundle technology
- Slim high fibre count cable to allow a maximum of cables in cable trays
- Reduced weight in cable trays
- Bend insensitive fibre inside cables
- Short bend radius for ease of installation
- Flame (IEC 60332-1) and fire retardant (IEC 60332-3)
- LSZH jacket



High cable density trays

- Small diameter allows high number of cables

	Diameter	Weight	Bend Radius operation	Bend Radius installation	Crush resistance	Max pulling force installation
12F	3.6 mm	18 kg/km	36 mm	72 mm	1000 N/10 cm	450 N
24 F	5.4 mm	30 kg/km	54 mm	108 mm	1000 N/10 cm	450 N
48 F	5.4 mm	30 kg/km	54 mm	108 mm	1000 N/10 cm	450 N
96 F	6.7 mm	36 kg/km	67 mm	134 mm	1000 N/10 cm	450 N

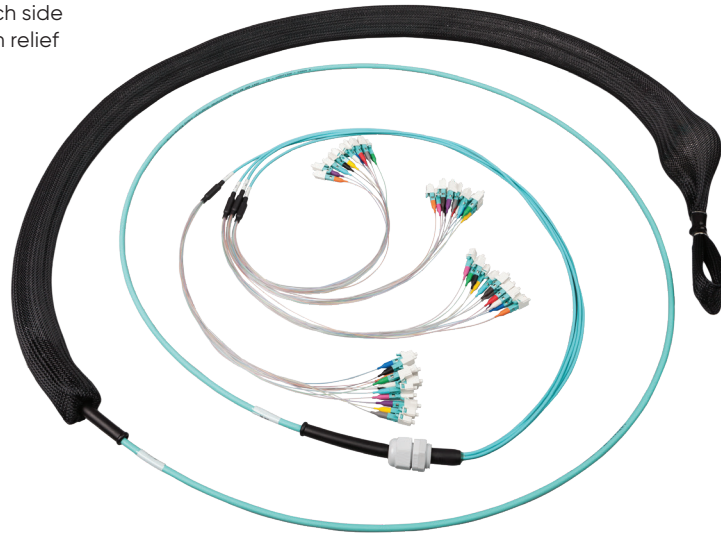
- Double or triple amount of cables compared to traditional solutions
- Space limitations in central patching zones reduced

Max number of cable: 427 cables of 48 fibres in 500mx50mm= 20496 fibres



Pre-Term specification

- Black pulling protection net with bubble foam on one side
- Pulling eye one side
- Maximum pulling force on pulling eye: 450N
- Protective bubble foam second on each side
- Cable gland with rubber boot for strain relief
- Small transition fan-out
- Made to order with 1m increments to reduce overlengths



Optical Performance

- Ultra low loss performance for multimode
- Low loss performance for singlemode
- Allows for more connections and longer length

Connection type	Max	Maximum Return Loss
LC multimode	0,25 dB	30 dB
LC singlemode	0,25 dB	40 dB
LC singlemode APC	0,25 dB	55 dB
MPO multimode	0,25 dB	20 dB
MPO singlemode APC	0,3 dB	45 dB

Packaging

- All Pre-Terms are on cardboard reels
- Volume reel can be reduced quickly: easy to dispose



LANmark-OF ENSPACE LC/ LC Fibre Assembly

- Dual stage fan-out for installation inside the ENSPACE panel and inside the ENSPACE module
- Pre-Term based on Micro-Bundle technology
- Cable optimised for installation in Data Centres: small diameter, small bend radius and reduced weight
- Superior fire performance: Euroclass Cca s1,d1,a1
- Fibres identified with coloured boots
- Fibre pair flip to maintain transmit-receive polarity implemented in manufacturing
- Low loss insertion loss performance: Max 0,25 dB per LC connection
- Fibre count: 12x, 24x, 48x and 96x
- Fibre type: OM4, OM5 and singlemode (OS2)



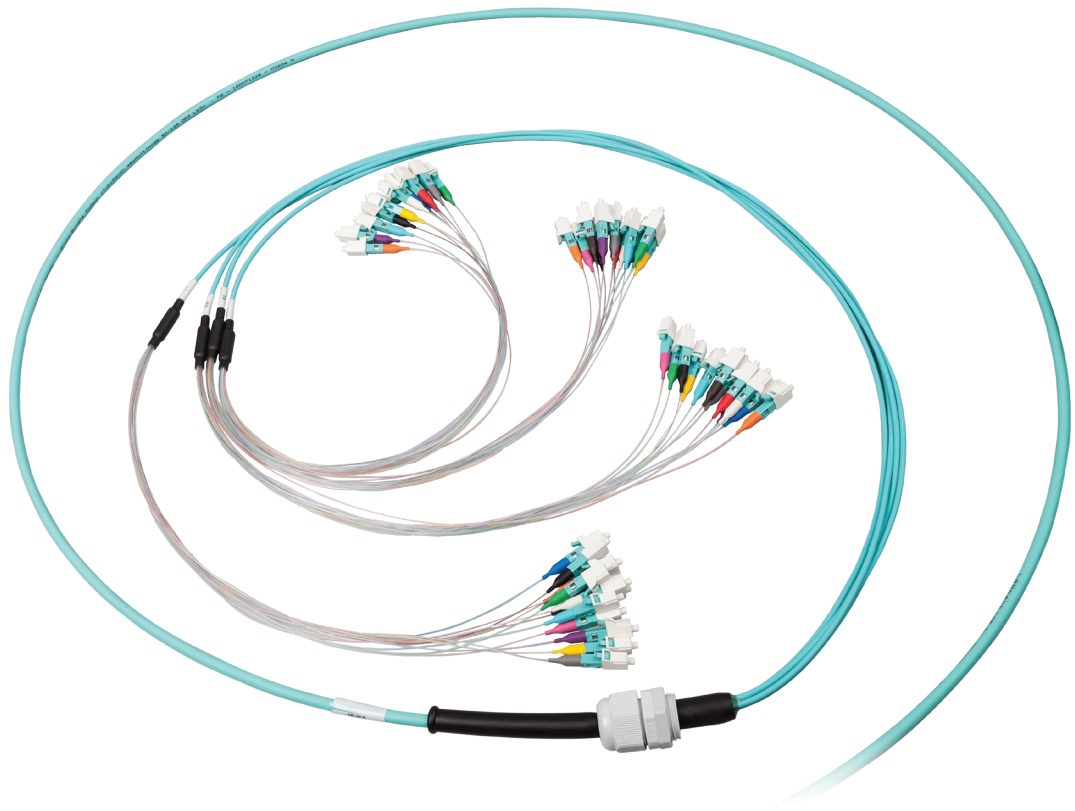
12
24
48
96



Cca



OM4
OM5
OS2



N15a.DnnccExxx-eC : ENSPACE LC/LC Pre

N15	a.	D	nnn	c	E	xxx	e	C
	Fibre type	ENSPACE LC/LC Pre-term	Fibre count	Connector type	Fan-out optimised for ENSPACE panel	length in m	Colour cable sheath	Fire performance class
	4 Singlemode OS2		12	L LC connector			Y Yellow for Singlemode	Cca s1,d1,a1
	7 Multimode OM4		24	P LC/APC connector			A Aqua pour OM4	
	9 Multimode OM5		48				V Violet for OM4	
			96				L Lime Green for OM5	

LANmark-OF ENSPACE MPO/ MPO Fibre Assembly

- Fibre assembly for installation inside the ENSPACE and Plug&Play panel
- Cable optimized for installation in Data Centre: small diameter, small bend radius and reduced weight
- Superior fire performance: Euroclass C2ca s1,d1, d1
- Polarity method B for universal polarity
- Pre-Term can be used together with MPO-LC modules for LC connectivity or with MPO-adaptor modules for parallel optics
- Male-male/pinned-pinned Pre-Terms
- Low loss insertion loss performance: Max 0,25 dB per MPO connection for singlemode and multimode
- Fibre count: 12x, 24x, 48x and 96x
- Fibre type: OM4, OM5 and singlemode (OS2)



Universal Polarity

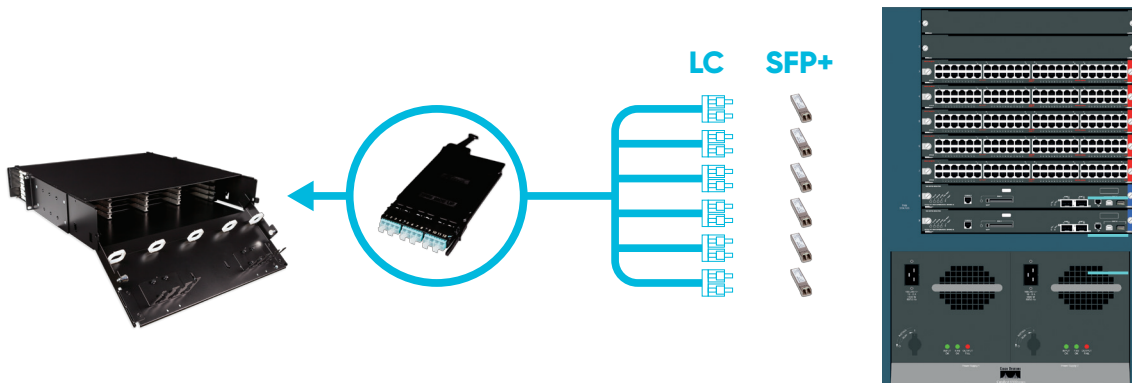


N15a.PnnnMMExxx-eC

N15	a.	P	B	nnn	c	MM	E	xxx	e	C
	Fibre type	polarity for MPO/MPO	polarity method B	fibre count	Connector type	male-male pre-term	Fan-out optimised for ENSPACE panel	length in m	colour cable sheath	Fire performance class
	4 Singlemode OS2 7 Multimode OM4 9 Multimode OM5			12 24 48 96	L LC connector P LC/APC connector				Y Yellow for singlemode OM4 A Aqua for OM4 V Violet for OM4 L Lime green for OM5	B2ca by Cca (code eC)

LANmark-OF ENSPACE Patching Assemblies

- High fibre count fibre assembly for connecting transceivers on switch and ENSPACE modules
- Switch side has a 2mm fan-out with uniboot DLC connector for connecting to SFP+ transceivers
- Panel side:
 - Dual stage 900 µm LC fan-out for installation inside the ENSPACE panel with the LC ENSPACE adaptor modules
 - Or male MPO-fan out for installation inside the ENSPACE panel with ENSPACE MPO-LC modules
- Micro-Bundle cable optimised for installation in Data Centre: small diameter, small bend radius and reduced weight
- Superior fire performance: Euroclass Cca s1,d1,a1
- Low loss insertion loss performance: max 0,25 dB per LC connection
- Fibre count: 12x, 24x, 48x and 96x
- Fibre type: OM4, OM5 and singlemode (OS2)



N15a.Snnbbccdxxxe-C

N15	a.	S	nnn	bb	cc	d	xxx	e	C
	Fibre Type	Patching assembly ENSPACE	fibre count	uniboot LC connector on switch side (L2: LC-connector)	connector inside panel	fan-out length switch side	length in m	Colour cable sheath	Fire Performance class
	4 Singlemode OS2		12		L9 LC connector	A: equal length 100cm		Y Yellow for Singlemode	C2ca s1,d1,a1
	7 Multimode OM4		24		P9 LC/APC connector	B: equal length 150cm		A Aqua for OM4	
	9 Multimode OM5		48		M3 male MPO connector	C: equal length 200cm		V Violet for OM4	
			96					L Lime Green OM5	

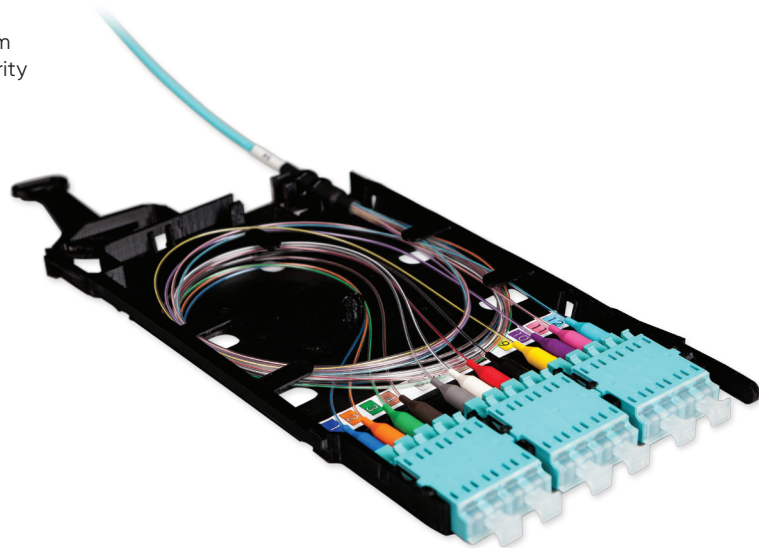
Polarity with ENSPACE Pre-Terms

Polarity with LC/LC Pre-Term

- Coloured boots for 900 µm fibres
- Integrated colour strip inside ENSPACE LC module
- Matching coloured boots with colours on strip guarantee error free installation for duplex transmission
- Required fibre pair flip in Pre-Term to maintain Transmit-Receive polarity introduced during manufacturing

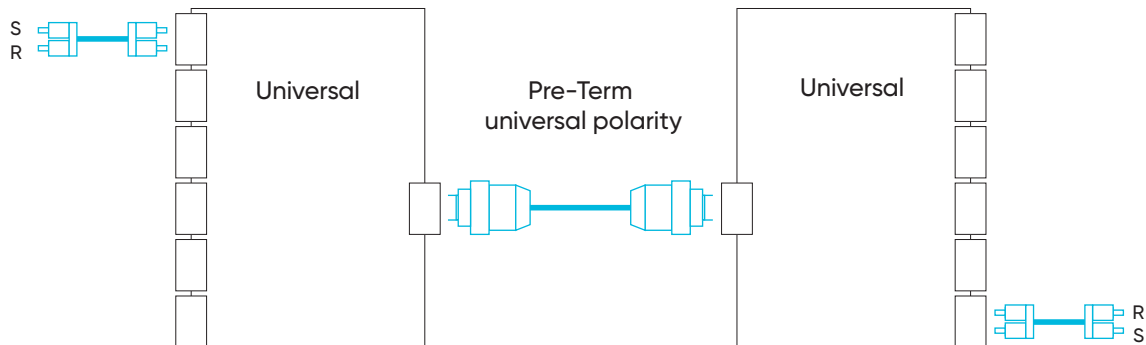


Universal polarity



Polarity with MPO-LC modules and MPO-MPO Pre-Term for Duplex Transmission

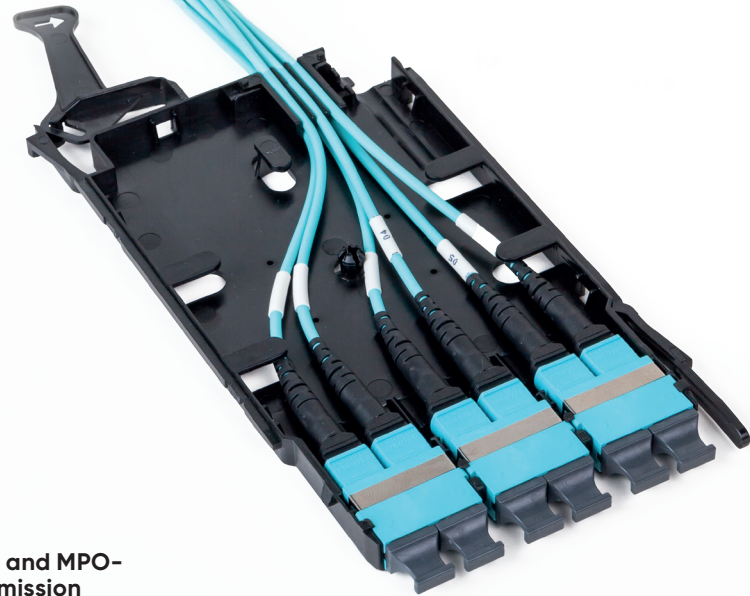
Duplex Transmission





Universal polarity

Polarity with with MPO adaptors and MPO-
MPO Pre-Terms for Parallel transmission

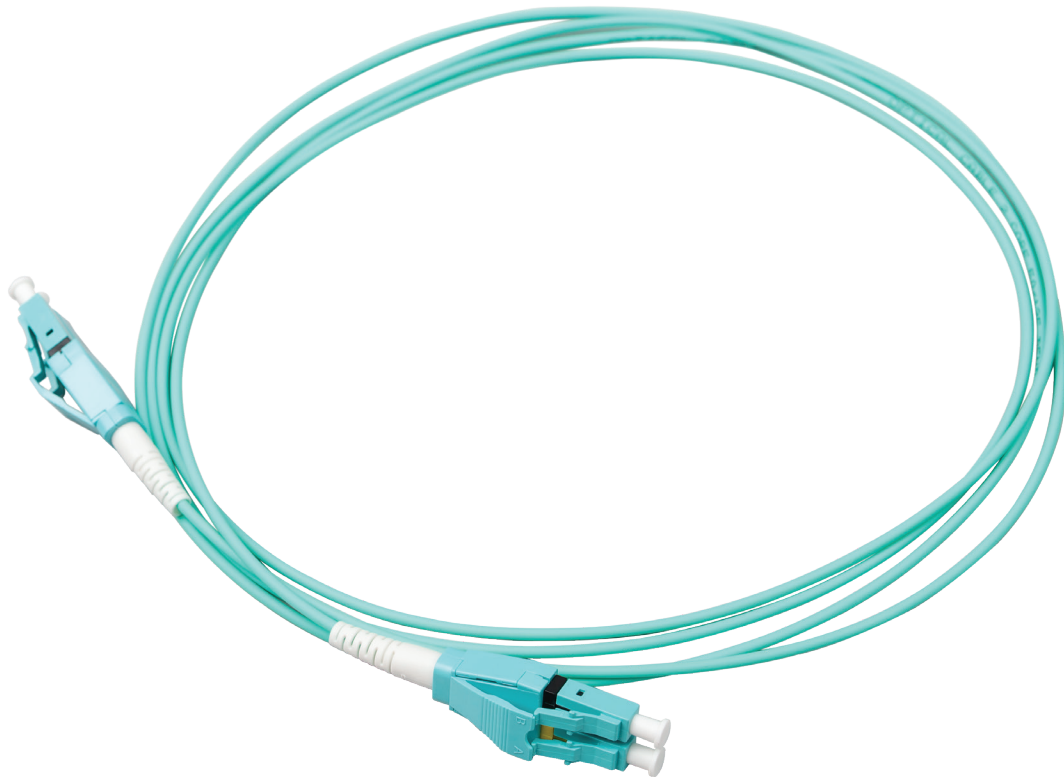


Parallel Transmission



LANmark-OF ENSPACE LC-LC Patch cords

- Uniboot style duplex LC connectors
- Slim 2mm round patch cord cable to reduce required space in dense patching zones
- Improved handling in high-density applications
- Low-loss connectivity enables system design flexibility
- Bend radius reduced to 10 mm with GIGAliteFlex bend insensitive fibre
- Designed to withstand tight bends and challenging cable routes
- Low-smoke and zero-halogen (LSZH)
- Flame retardant
- Reverse polarity uniboot connector



Reference	Description
N122.7UUAx	LANmark-OF ENSPACE Patch Cord DLC-DLC OM4 LSZH xm Aqua
N122.7UUVx	LANmark-OF ENSPACE Patch Cord DLC-DLC OM4 LSZH xm Violet
N122.9UULx	LANmark-OF ENSPACE Patch Cord DLC-DLC OM5 LSZH xm Lime Green
N122.4UUYx	LANmark-OF ENSPACE Patch Cord DLC-DLC Singlemode LSZH xm Yellow

LANmark-OF ENSPACE MPO-MPO Patch cords

- MPO-MPO patch cords
- MPO PRO connectors for easy gender and polarity change
- Slim round patch cable with 2,5 mm diameter
- Small bend radius of 40mm
- Female-Female patch cord to fit with male MPO connector of MPO Pre-Term or male QSFP+ connector
- Available in OM4 and SM
- Low loss performance: 0,25 dB/MPO connection, typical insertion loss 0,125 dB/MPO connection
- Straight wiring with key up/key up design
- Parallel Optics: 40GBase-SR4 and 100GBase-SR10
- Low-smoke and zero-halogen (LSZH)



OM4
SM



Reference	Description
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N125.7GGAx	LANmark-OF Patch Cord Female MPO PRO – Female MPO PRO OM4 LSZH xm Aqua
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N125.7GGVx	LANmark-OF Patch Cord Female MPO PRO – Female MPO PRO OM4 LSZH xm Violet
-------------------	--------------------------------------------------------------------------

N125.4GGYx	LANmark-OF Patch Cord Female MPO PRO – Female MPO PRO SM LSZH xm Yellow
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LANmark-OF MTP PRO Tools and Accessories

- Field tool for MTP PRO connectors to change polarity and gender
- Gender change can be done without opening the connector
- PIN exchangers are required for gender change
- No accessory required for polarity change: keys already included in MTP PRO connector
- Polarity can be changed from key down to key up and key up to key down



- Sample box to demonstrate MTP PRO connectivity for easy changing gender and polarity in the field
- Sample tool box includes
- LANmark-OF MTP PRO gender and Polarity Field Tool
- LANmark-OF MTP PRO Pin Exchanger Female Multimode Aqua 10X
- LANmark-OF MTP PRO Pin Exchanger Male Singlemode Yellow 10X
- LANmark-OF MPO Cleaning Tool
- MTP-MTP patch cord sample



- MTP PRO multimode pin exchangers to change gender from female to male
- The pin exchangers provide the pins to make the female MTP PRO connector male
- One tube contains 10 exchangers

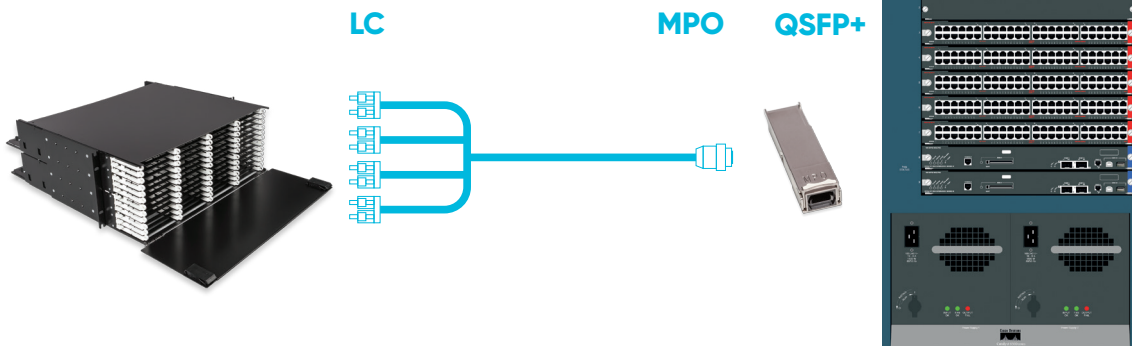


Reference	Description
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N890.160	LANmark-OF MTP PRO Sample Box
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LANmark-OF Aggregation Assembly

- Factory terminated fibre assembly
- Female MPO towards 4x uniboot DLC connectors
- Female MPO connector for connecting to QSFP+ transceiver on switch
- Uniboot DLC connectors for patching on front of patch panel
- 8 cores
- Aggregation of 4X 10G channels into 1x 40G port on switch
- Fibre type: OM4
- Low loss connectivity performance: Max of 0,3 dB per connection



N127.aFbdex

N127	a.	F	b	d	e	x
	fibre type	female MPO connector for insertion in QSFP+ transceiver	fan-out length patch panel	fan-out length patch panel	Colour cable sheath	Length in m
	7 Multimode OM4		L DLC connector P DCL/APC connector	A: equal length 100cm B: equal length 150cm C: equal length 200cm	A Aqua for OM4 V Violet for OM4	C2ca s1,d1,a1

Guaranteed distances

Guaranteed distances : LANmark-OF OM4

Products

LANmark-OF OM4 cables terminated with LC/SC connectors or pigtails
LANmark-OF OM4 LC/SC Pre-Terms

Ethernet distances

Applications	Pre-Terminated ST/SC/LC Assemblies			Direct termination or splicing with ST/SC/LC		
	2	4	6	2	4	6
1GBase-SX	970m	960m	940m	930m	880m	820m
10GBase-SR	550m	540m	530m	520m	490m	460m
25GBase-SR	120m	110m	105m	110m	90m	70m
40G BiDi	175m	150m	130m	140m	NA	NA
40G SWDM	350m	350m	350m	350m	NA	NA
100G BiDi	100m	100m	100m	100m	NA	NA
100G SWDM	100m	100m	100m	100m	NA	NA

Fibre Channel Distances

Applications	Pre-Terminated ST/SC/LC Assemblies			Direct termination or splicing with ST/SC/LC		
	2	4	6	2	4	6
1GFC (PI-4 100-M5F-SN-I)	1250m	1230m	1200m	1140m	1000m	800m
2GFC (PI-4 200-M5F-SN-I)	750m	740m	720m	680m	560m	460m
4GFC (PI-5 400-M5F-SN-I)	500m	475m	450m	470m	420m	370m
8GFC (PI-5 800-M5F-SN-I)	250m	230m	220m	220m	190m	130m
16GFC (PI-5 1600-M5F-SN-I)	170m	150m	145m	150m	125m	60m
32GFC (PI-6 3200-5MF-SN-I)	125m	115m	110m	110m	95m	65m

Guaranteed distances : LANmark-OF OM4 MPO

Products

LANmark-OF OM4 ultra low loss MPO-MPO Pre-Term Assemblies
LANmark-OF OM4 ultra low loss MPO-LC module

Ethernet distances-duplex transmission

MPO-LC modules	2	4	6
1GBase-SX	930m	910m	890m
10GBase-SR	520m	510m	500m
25GBase-SR	115m	105m	100m
40G BiDi	165	120	110
40G SWDM	350m	350m	350m
100G BiDi	100m	100m	100m
100G SWDM	100m	100m	100m

Ethernet distances-parallel transmission

MPO connections	2	4	6
40GBase-SR4	175	150	130
40GBase-SR4 extended distances*	400m	360m	330m
100GBase-SR4	120m	110m	105m

* Aginode approved transceivers

Fibre Channel Distances-duplex transmission

MPO-LC modules	2	4	6
1GFC (PI-4 100-M5F-SN-I)	1150m	1120m	1050m
2GFC (PI-4 200-M5F-SN-I)	680m	660m	620m
4GFC (PI-5 400-M5F-SN-I)	480m	420m	410m
8GFC (PI-5 800-M5F-SN-I)	240m	205m	190m
16GFC (PI-5 1600-M5F-SN-I)	160m	135m	130m
32GFC (PI-6 3200-5MF-SN-I)	120m	105m	100m

Guaranteed distances : LANmark-OF OM5

Products

LANmark-OF OM5 cables terminated with LC/SC connectors or pigtails

LANmark-OF OM5 LC/SC Pre-Terms

Ethernet distances

Applications	Pre-Terminated ST/SC/LC Assemblies			Direct termination or splicing with ST/SC/LC		
Connections	2	4	6	2	4	6
1GBase-SX	970m	960m	940m	930m	880m	820m
10GBase-SR	550m	540m	530m	520m	490m	460m
25GBase-SR	120m	110m	105m	110m	90m	70m
40G BiDi	175m	150m	130m	140m	NA	NA
40G SWDM	440m	440m	440m	440m	NA	NA
100G BiDi	100m	100m	100m	100m	NA	NA
100G SWDM	150m	150m	150m	150m	NA	NA

Fibre Channel Distances

Applications	Pre-Terminated ST/SC/LC Assemblies			Direct termination or splicing with ST/SC/LC		
Connections	2	4	6	2	4	6
1GFC (PI-4 100-M5F-SN-I)	1250m	1230m	1200m	1140m	1000m	800m
2GFC (PI-4 200-M5F-SN-I)	750m	740m	720m	680m	560m	460m
4GFC (PI-5 400-M5F-SN-I)	500m	475m	450m	470m	420m	370m
8GFC (PI-5 800-M5F-SN-I)	250m	230m	220m	220m	190m	130m
16GFC (PI-5 1600-M5F-SN-I)	170m	150m	145m	150m	125m	60m
32GFC (PI-6 3200-5MF-SN-I)	125m	115m	110m	110m	95m	65m

Guaranteed distances : LANmark-OF OM5 MPO

Products

LANmark-OF OM5 ultra low loss MPO-MPO Pre-Term Assemblies

LANmark-OF OM5 ultra low loss MPO-LC module

Ethernet distances-duplex transmission

MPO-LC modules	2	4	6
1GBase-SX	930m	910m	890m
10GBase-SR	520m	510m	500m
25GBase-SR	115m	105m	100m
40G BiDi	165m	120m	110m
40G SWDM	440m	440m	440m
100G BiDi	100m	100m	100m
100G SWDM	150m	150m	150m

Ethernet distances-parallel transmission

MPO connections	2	4	6
40GBase-SR4	175	150	130
40GBase-SR4 extended distances*	400m	360m	330m
100GBase-SR4	120m	110m	105m

Fibre Channel Distances-duplex transmission

MPO-LC modules	2	4	6
1GFC (PI-4 100-M5F-SN-I)	1150m	1120m	1050m
2GFC (PI-4 200-M5F-SN-I)	680m	660m	620m
4GFC (PI-5 400-M5F-SN-I)	480m	420m	410m
8GFC (PI-5 800-M5F-SN-I)	240m	205m	190m
16GFC (PI-5 1600-M5F-SN-I)	160m	135m	130m
32GFC (PI-6 3200-5MF-SN-I)	120m	105m	100m

Guaranteed distances : LANmark-OF SM

Products

LANmark-OF SM cables terminated with LC/SC connectors or pigtails

LANmark-OF SM LC/SC Pre-Terms

LANmark-OF SM / Direct Termination, Splicing and Pre-Terminated*

Applications	2 connections	3 connections	4 connections	5 connections	6 connections
100 Base-SX	2000	-	-	-	-
1GBase-LX	5000	4900	4500	4000	3500
10GBase-LR	10 000	9000	7500	6000	4500
10GBase-LW	10 000	9000	7500	6000	4500
10GBase-LX4	10 000	8500	6750	5250	3500
4Gbit-FC (PI-5 400-SM-LC-L)	10 000	10 000	7500	6000	4000
8Gbit-FC (PI-5 800-SM-LC-L)	10 000	10 000	7500	6000	4000
10GBase-FC (1200-SM-LL-L)	10 000	9000	7500	6000	4500
10GBase-FC (1200-SM-LC4-L)	10 000	8500	6750	5250	3500
16Gbit-FC (PI-5 1600-SM-LC-L)	10 000	10 000	7500	6000	4000
40Gbase-LR4	10 000	10 000	9000	7000	5000
100Gbase-LR4	10 000	10 000	8000	6000	4000

* with one splice every 2 km between 2 connections if required.

Guaranteed distances : LANmark-OF SM MPO

Products

LANmark-OF SM low loss MPO-MPO Pre-Term Assemblies

LANmark-OF SM low loss MPO-LC module

LANmark-OF SM /MPO low loss connectivity*

Applications	2 MPO modules	3 MPO modules	4 MPO modules	5 MPO modules
1GBase-LX	5000	3000	-	-
10GBase-LR	9000	7000	2500	-
4Gbit-FC (PI-5 400-SM-LC-L)	10 000	10 000	6000	3000
8Gbit-FC (PI-5 800-SM-LC-L)	10 000	8000	6000	3000
16Gbit-FC (PI-5 1600-SM-LC-L)	10 000	8000	6000	3000
40GBase-LR4	10 000	10 000	7000	4000
100GBase-LR4	10 000	10 000	6500	3500

* with one splice every 2 km between 2 connections if required

LANmark™

Copper solutions

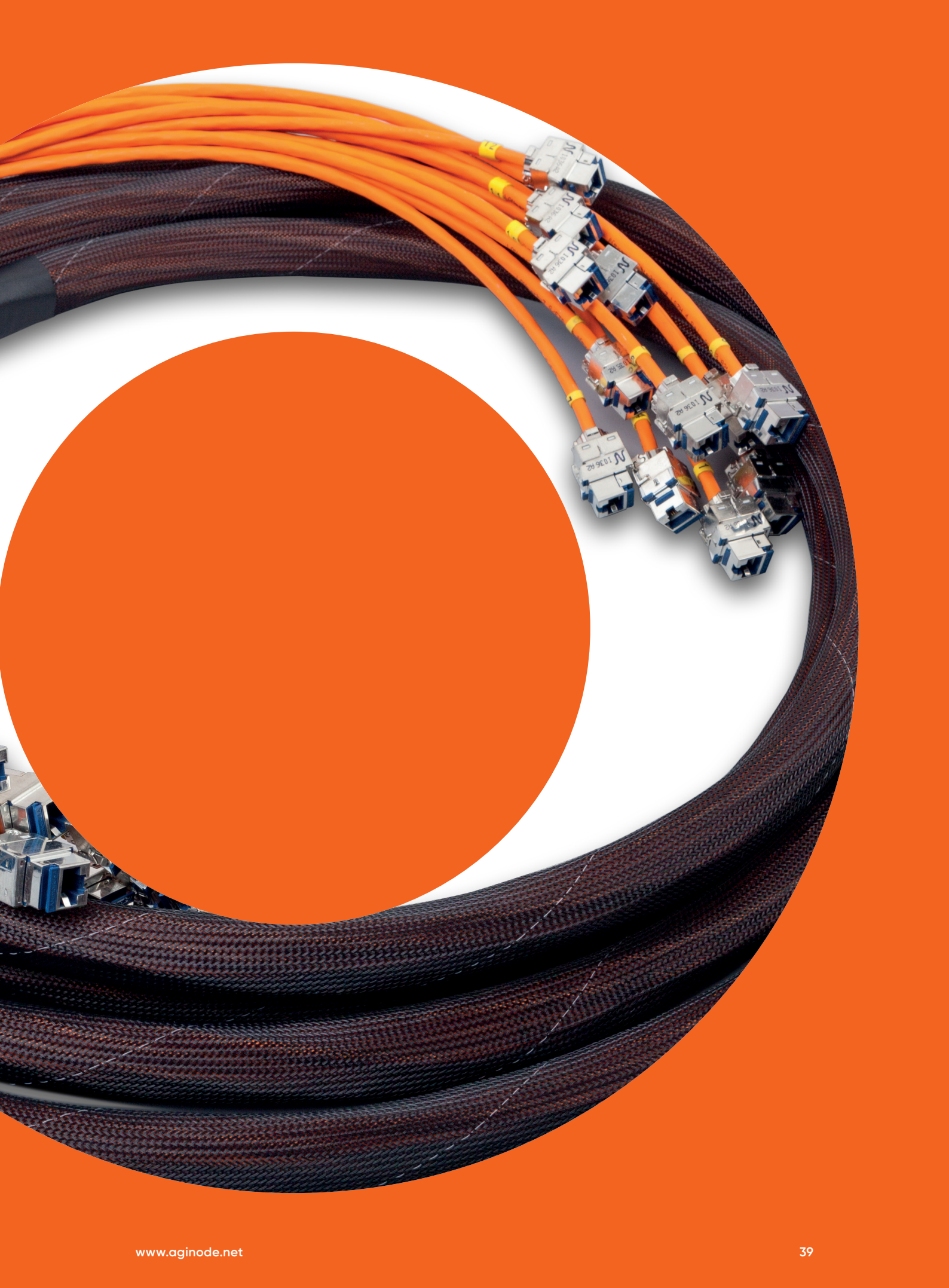


**More
Data**



**More
Power**





LANmark-6A for 10Gb/s Ethernet

Aginode's LANmark-6A cabling system is today's standard solution for enterprise and Data Centre environments, offering guaranteed bandwidth to 500 MHz and therefore supporting 10G-BaseT, currently the highest widely deployed application over horizontal copper cabling.

LANmark-6A cables and connectivity are manufactured and tested to the latest Cat 6A specifications defined in the International, European and American cable and cabling standards, including ISO 11801, EN 50173-1 and ANSI/TIA 568.2-D.

The LANmark-6A range supports short channel lengths down to 9m with 3 connection points (and 12m with 4 connection points). This makes it an ideal solution for modern Data Centres that are already facing severe space problems and where overlength cable is often installed in order to comply with a traditional minimum channel length of 24m. By reducing this minimum length, Data Centres no longer need to install unnecessary excess cable, therefore reducing costs whilst also saving critical space.

- Guaranteed superior channel headroom for: NEXT (2dB) - Return Loss (2dB) - Alien Crosstalk (15dB)
- Interoperability due to Cat 6A component compliance
- Ability to install very short links, crucial in Data Centres

LANmark-6A Cable F/FTP

- Ideal cable for 10Gbase-T applications
- Full compliance to latest standards for Cat 6A and Class EA
- Guaranteed performance up to 500MHz
- Combination of global and individual pair shielding offering ANEXT immunity
- Standard LSZH version meeting IEC 60332-1
- Meeting IEC 60332-3



LANmark-6A Cable F/UTP

- Ideal cable for 10Gbase-T applications
- Full compliance to latest standards for Cat 6A and Class EA
- Guaranteed performance up to 500MHz
- Global screen offering ANEXT immunity
- Foil with aluminium side facing outwards providing easy bonding to connector
- Offering same ease of installation as UTP cables, but with full protection against noise
- Standard LSZH version meeting IEC60332- 1
- Meeting IEC 60332-3

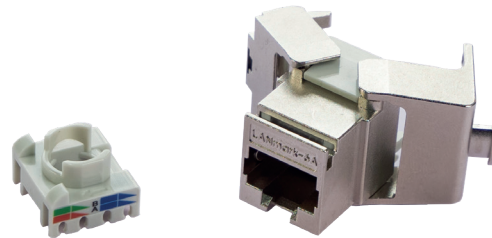


LANmark-6A for 10Gb/s Ethernet

LANmark-6A Snap-In Connector

Cat 6A

- High speed Category 6A shielded connector
- Full compliance with TIA and ISO Category 6A cabling standards
- Superior headroom by use of new engine technology
- Supports PoE++ Type 4 applications delivering up to 90W/71W (IEEE 802.3bt)
- Die-cast housing with 360° shielding offering excellent EMC and Alien Crosstalk performance
- Toolless termination enabling fast and easy installation
- Accepts solid and stranded wire from AWG26 to AWG22
- Easily re-installable
- 3rd party certification for Link and Channel
- UL listed
- Snap-In format convertible to keystone using optional adaptation clip
- Zero plastic packaging – pack of 48 connectors



LANmark-6A Ultim UniBoot Patch Cords

Cat 6A

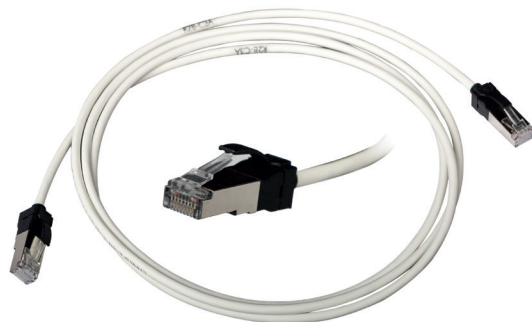
- High speed RJ45 patch cord to run 10Gbase-T and future Cat 6A applications
- High density support due to slim boot design
- Frequency range up to 500MHz, fully compliant with Cat 6A TIA-568-C.2 and ISO11801:2011
- Individually screened pairs offering internal and external noise immunity (NEXT and ANEXT)
- Certified by Delta independent test lab
- Black removable latch protector, replaceable with 7 other colours, offering possibility of differentiation between services



LANmark-6A Slimflex Uniboot Patch Cord

Cat 6A

- Small diameter RJ45 cords with AWG28 copper conductors
- High density support due to slim cable design offering 20% space saving
- High flexibility compared to standard cords
- White LSZH jacket
- Black removable latch protector, replaceable with 7 other colours, offering possibility of differentiation between services



LANmark-6A for 10Gb/s Ethernet & PoE

Reference	Description
N100.671G F/UTP	LANmark-6A F/UTP AWG23 Cat6A LSZH Orange 1000m/reel
N100.672G F/UTP	LANmark-6A F/UTP AWG23 Cat6A LSZH Orange 500m/reel
N100.675G-O5 F/UTP	LANmark-6A F/UTP AWG23 Cat6A LSZH IEC60332-3-22 Orange 1000m/reel
N100.676G-O5 F/UTP	LANmark-6A F/UTP AWG23 Cat6A LSZH IEC60332-3-22 Orange 1000m/reel
N100.692G F/FTP	LANmark-6A F/FTP AWG23 Cat6A LSZH Orange 1000m/reel
N100.694G F/FTP	LANmark-6A F/FTP AWG23 Cat6A LSZH Orange 500m/reel
N100.692G-O5 F/FTP	LANmark-6A F/FTP AWG23 Cat6A LSZH IEC60332-3-24 Orange 1000m/reel
N100.694G-O5 F/FTP	LANmark-6A F/FTP AWG23 Cat6A LSZH IEC60332-3-24 Orange 500m/reel
N420.68A-02	LANmark-6A Snap-In Connector Cat.6A Screened UL, 48PCS/BOX
N1SA.P1JXXXWK	LANmark-6A SlimFlex S/FTP Screened Patch Cord LSZH Xm White 28AWG
N11A.U1FxxxOK	LANmark-6A Ultim Patch Cord Cat 6A Screened LSZH Orange ("xxx" denoting length: 010 = 1m, 020 = 2m, 100 = 10m)
N11A.U1FxxxDK	LANmark-6A Ultim Patch Cord Cat 6A Screened LSZH Grey ("xxx" denoting length: 010 = 1m, 020 = 2m, 100 = 10m)
N110.LPX	LANmark Latch Protector 50x ("X" denoting colour: K = Black, B = Blue, D = Dark Grey, G = Green, O = Orange, R = Red, Y = Yellow, W = White)
N420.110	Cable Stripper 25x



HD panel with Slimflex cords:
48 Slimflex cords fit easily into a 1U panel.

LANmark-7A for 10/25 Gigabit Ethernet & High Power PoE

Aginode LANmark-7A is a unique twisted pair cabling solution which supports the 25Gbase-T application over at least 30m, is fully compliant to the Class FA/Cat7A Cabling Standard and at the same time fully compatible to the RJ45 Interface.

LANmark-7A is built around the GG45 connector interface which was invented by Alcatel and was standardised as Class F interface in 2002 and Class FA interface in 2008. Although already for many years now, LANmark-7A components have proven to fulfill not only the requirements for 10Gbase-T (defined in 2008), but also for 25 Gbase-T (defined in 2016).

	25Gbase-T	Class FA 30 m / Cat 7A	Class FA 40 m / Cat 7A
PSACR at 1000 MHz (Minimum)	- 3,4 dB	+22,5 dB	+16,4 dB
Positive ACR (Minimum)	1+ -900 MHz	1- >2500 MHz	1- >2000 MHz
IL (Maximum)	22,55 dB à 1000 MHz	22,35 dB à 1000 MHz	28,54 dB à 1000 MHz*
PSNEXT (Minimum)	19 dB à 1000 MHz	45 dB à 1000 MHz	45 dB à 1000 MHz
Salz SNR (Minimum)	~32 dB	~38 dB	~35 dB
Delay (Maximum)	185 ns	125 ns	165 ns

*10Gbase-T operates with ~43dB attenuation at 430MHz

Aginode's LANmark-7A solution is specified up to 1250 MHz at least. Higher frequency support is possible as Aginode offers multiple cables with various frequency ranges and the GG45 connector supports high frequencies up to 2GHz.

While 25Gbase-T LOM or NIC Cards will be build to support at least 30m, LANmark-7A cabling will potentially support some additional length of 10-20%. LANmark-7A offers additional ACR and clearly reduced Electrical Delay, so that some extended length is likely. For example, LANmark-7A supports 10Gbase-T up to 120m instead of 100m. A similar extension for 25Gbase-T can be expected.

LANmark-7A therefore is ideal for Data Centres which currently use 10 Gbps line speed at server ports. LANmark-7A can be installed in cost effective End or Middle of Row Architectures and offers cabling for 2 performance steps ahead of today: 10Gbase-T and 25Gbase-T.

LANmark GG45 Connector

LANmark GG45 is a screened RJ45-compatible cable jack specified up to 2000 MHz. It is designed specifically to support the high frequencies required for applications beyond 10 Gigabit Ethernet.

- Combined with LANmark-7A cable and patch cords, GG45 offers support for 25Gbase-T
- Combined with a LANmark-8 2GHz cable, GG45 offers support for 40Gbase-T

LANmark GG45 uses 12 contacts: 8 contacts for the 2000MHz transmission (GG-mode) and 4 additional contacts to ensure RJ45 compatibility (RJ Mode). Thanks to its 360° screening and a fully closed rear cover, the connector allows excellent coupling attenuation and ensures immunity from alien crosstalk and other external interference. The LANmark GG45 connector fits in all structural hardware designed for the Snap-In Connectors and can be used in all positions of a 4-connector twisted pair cabling channel (PP, CC, CP, TO).



Cat 7A

LANmark-7A Cable AWG23

LANmark-7A S/FTP AWG23 is a 4-pair cable with individual pair foils and an overall braid offering superior performance up to 1250 MHz. The cable is fully compliant with Category 7A standards for Enterprise and Data Centre use cases. It supports 10Gbase-T over 100m and 25 Gbase-T over 30m. In combination with GG45 connectivity also extended drive distances can be supported.

- Largely reduced noise levels to support high Signal to Noise Ratios
- Double Screening makes cables immune against Alien Crosstalk
- Energy Savings of 2.5Watts/100m using PoE++ are possible



Cat 7A

LANmark-7A 1600 Cable AWG22

LANmark-7A 1600 S/FTP AWG22 is a 4-pair cable with individual pair foils and an overall braid offering superior performance up to 1600 MHz. The cable is fully compliant with Category 7A standards for Enterprise and Data Centre use cases.

It supports 10Gbase-T over 100m and 25Gbase-T over 30m. In combination with GG45 connectivity also extended drive distances can be supported.

- Largely reduced noise levels to support high Signal to Noise Ratios
- Double Screening makes cables immune against Alien Crosstalk
- Energy Savings of 3 Watts/100m using PoE++ are possible



Cat 7A

LANmark-6A RJ45 Patch Cord

To connect a LANmark-7A Permanent Link to a RJ45 Server Port normal RJ45 can be used (see LANmark-6A Range).

This reduces the investment cost during the time of 1Gb/s and 10Gbase-T networking.

Cat 6A

LANmark-7A GG45 to RJ45 Patch Cord

Aginode's LANmark-7A GG45 to RJ45 cords with GG45 8C Plug on one side and a 1250 MHz RJ45 plug on the other end can be used to upgrade the network to 25Gbase-T, when NIC cards become available. These cords connect a GG45 based permanent link with 25G active equipment. The protruding part on the plug activates the switch within the GG45 "2-in-1" jack and terminates the not used contacts of RJ45 to ground.

Using the contacts in the extreme outer corners of the GG45 interface for transmission, excellent NEXT and Return Loss performances are achieved.

Cat 7A

GG45 Measurement Cord

Aginode's GG45/GG45 Measurement Cords with GG45 8C Plug on both sides support verification testing in Field installations using Channel adaptors.



LANmark-7A Patch Cord

- High bandwidth patch cord for 25 Gigabit applications and beyond
- Runs the GG45 '2-in-1' Connector in its high speed GG-Mode
- Use GG45 8 Contact Plugs according IEC61076-3-110
- Allow full 4-connector Class FA channels
- Compatible with High Density requirements in Data Centres



Reference	Description
N100.371-OB	LANmark-7A 1250 S/FTP AWG23 Cat 7A 1250MHz LSZH B2ca s1a d1 a1 Orange 1000m reel
N100.371-OC	LANmark-7A 1250 S/FTP AWG23 Cat 7A 1250MHz LSZH Cca s1a d1 a1 Orange 1000m reel
N100.371-OD	LANmark-7A 1250 S/FTP AWG23 Cat 7A 1250MHz LSZH Dca s2 d1 a1 Orange 1000m reel
N100.372-OD	LANmark-7A 1250 S/FTP AWG23 Cat 7A 1250MHz LSZH Dca s2 d1 a1 Orange 500m reel
N100.373-OD	LANmark-7A 1250 S/FTP Dual AWG23 Cat 7A 1250MHz LSZH Dca s2 d1 a1 Orange 500m reel
N100.381-OD	LANmark-7A 1600 S/FTP AWG22 Cat 7A 1600MHz LSZH Dca s2 d1 a1 Orange 1000m reel
N100.383-OD	LANmark-7A 1600 S/FTP Dual AWG22 Cat 7A 1600MHz LSZH Dca s2 d1 a1 Orange 500m reel
N420.735	LANmark-7A GG45 12C Snap-In Connector Cat 7A 1000MHz Screened
N420.736	LANmark-7A GG45 12C Snap-In Connector Cat 7A 1000MHz Screened for stranded wire
N420.738	GG45 Right angle 8 contact jack for PCB mount
N101.2DACO	LANmark-7A Patch Cord 1250MHz GG45 8C to RJ45 Screened LSZH Orange 1.0m
N101.2DAEO	LANmark-7A Patch Cord 1250MHz GG45 8C to RJ45 Screened LSZH Orange 2.0m
N101.2DAFO	LANmark-7A Patch Cord 1250MHz GG45 8C to RJ45 Screened LSZH Orange 3.0m
N101.23AEO	LANmark-7A Patch Cord GG45 8C Cat 7A Screened LSZH 2m Orange
N101.23AFO	LANmark-7A Patch Cord GG45 8C Cat 7A Screened LSZH 3m Orange
N900.67A	GG45 8C Measurement Cord Cat 7A Screened LSZH 2m Orange

LANmark-8 for 40 Gb/s Ethernet

Aginode LANmark-8 is a cabling solution which supports the 40Gbase-T application as well as 25Gbase-T, is fully compliant to the Class I/II Cabling Standards and is at the same time fully compatible to the RJ45 Interface. LANmark-8 is build around the GG45 Connector Interface which supports 2GHz. Aginode LANmark-8 solution is specified up to 2000 MHz and offers plenty of additional headroom above the application requirements.

	40Gbase-T	LANmark-8 30 m	LANmark-8 35 m for information
PSACR à 1600 MHz (Minimum)	- 16,5 dB	+6,9 dB	0,5 dB
Positive ACR (Minimum)	1 + -900 MHz	1- >1975 MHz	1- >1620 MHz
IL (Maximum)	29,43 dB à 1600 MHz	27,20 dB à 1600 MHz	31,20 dB à 1600 MHz*
PSNEXT (Minimum)	9,9 dB à 1600 MHz	34 dB à 1600 MHz	34 dB à 1600 MHz
Salz SNR (Minimum)	~32 dB	~36 dB	~34 dB
Delay (Maximum)	185 ns	125 ns	145 ns

While 40Gbase-T LOM or NIC Cards will be build to support at least 30m, LANmark-8 cabling will potentially support some additional length of ~10%. LANmark-8 offers additional ACR and clearly reduced Electrical Delay, so that some extended length is likely. For example, LANmark-7A supports 10Gbase-T up to 120m instead of 100m. A 10% extension for 40Gbase-T can be expected.

LANmark-8 therefore is ideal for Data Centres which currently use 10 Gbps at server ports. LANmark-8 can be installed in cost effective End or Middle of Row Architectures and offers cabling for 2 performance steps ahead of today: 25Gbase-T and 40Gbase-T.

Pre-Term Copper Assemblies

Definition

Aginode offers pre-connectorised assemblies in a range of configurations, from individual or in bundles of 6, 12 or 2x12 cables, with either male (plug) or female (jack) RJ45s (jack) terminated at the ends. Eliminating the need for on-site assembly, pre-connectorised links are the ideal solution for rapid deployment.

Installation and time saving

Aginode LANmark Pre-Term Units help reduce the installation time and risks as field connector termination is eliminated. Connectors are mounted and assemblies are tested in our factory.

Pre-connectorised assemblies are particularly suited to locations where rapid deployment is essential. A single assembly needs to be laid instead of 6, 12 or 24 individual cables, enabling very large-scale installation over very short periods. What's more, the assemblies can be labelled measure. Installation time is therefore reduced to to a strict minimum. The ideal solution for data centres!

- Reduce installation time
- No risk linked to field termination
- Supports the 4-connector channel configuration
- Labelling on each assembly (customisable)

Performance

Aginode's pre-assembled solutions are available in Cat 6A/Class EA and Cat 7A/Class FA, offering performance that exceeds current cabling standards.

All pre-connectorised assemblies are carried out in a controlled environment, ensuring that all connection and bundling procedures are consistent, repeatable and reliable.

All assemblies are individually tested and test reports are recorded for traceability purposes.

Guarantees

Aginode LANmark Pre-Term Units are covered by a 25-year parts and labour warranty as described in the Aginode Certified System Warranty. When installed in combination with LANmark patch cords of the same category, a channel warranty can be obtained. Aginode's Design Guidelines for length calculations and limitations according to the standards must be respected.

Configurations

The Aginode offer in pre-connectorised configurations:

- Individual cable assemblies
- Bundles of 6, 12 and 2x12 cables
- Connectorisation:
 - RJ45 female/female (jack-jack)
 - RJ45 female/male (jack-plug)
 - RJ45 male/male (plug-plug)

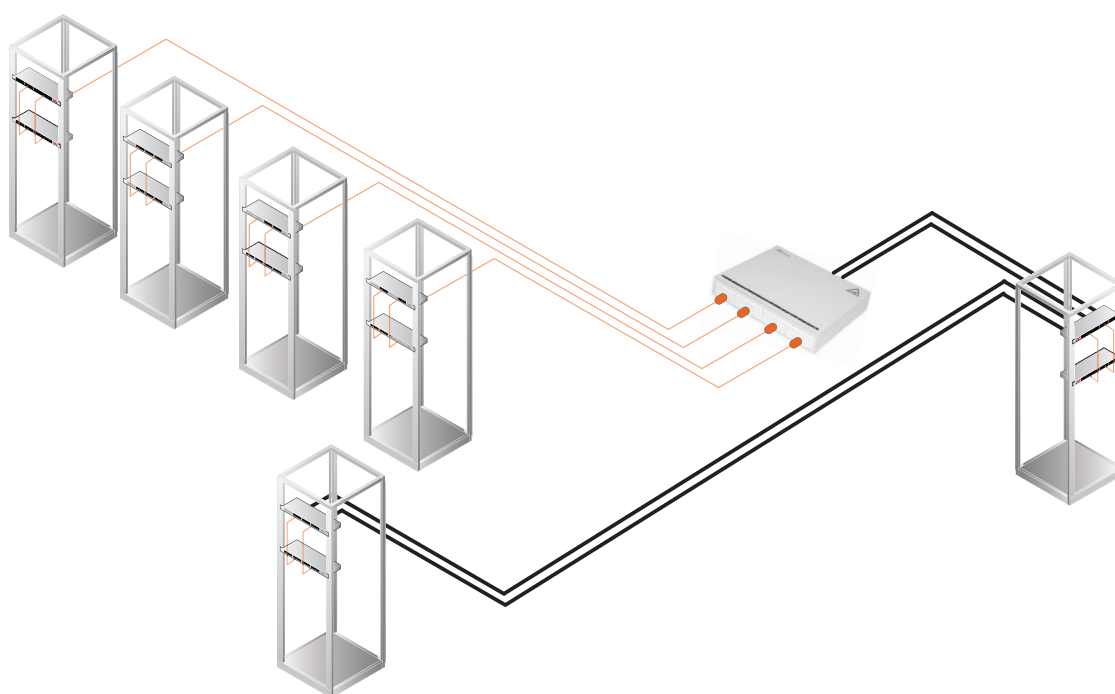
Specific to Aginode : stranded bundles

The bundles generally encountered are made up of separate cables positioned parallel to each other. The negative effect of this configuration is that the cables slip on each other when the bundle is wound and unwound, making it difficult to maintain alignment of the connectors at the ends.

Outer dimensions of bundles

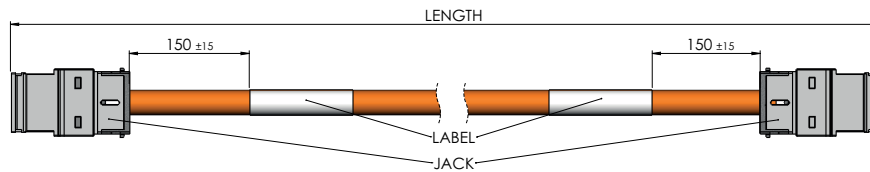
Cable	F/FTP Cat.6A 7,6 mm	S/FTP Cat.7A 7,7 mm	U/FTP Cat.6A stranded 6,0 mm
3 units	16,5 mm	17 mm	13 mm
4 units	18,5 mm	19 mm	14,5 mm
6 units	23 mm	23,5 mm	18,5 mm

Bundled units between server racks or patch panels and consolidation points

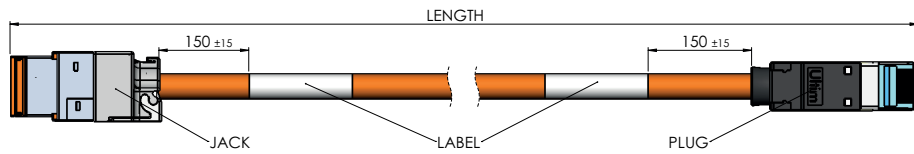


Single unit assemblies

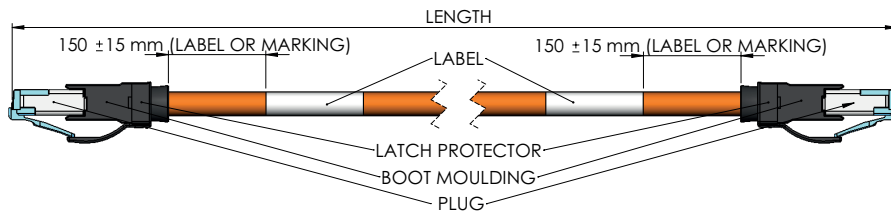
Jack-Jack



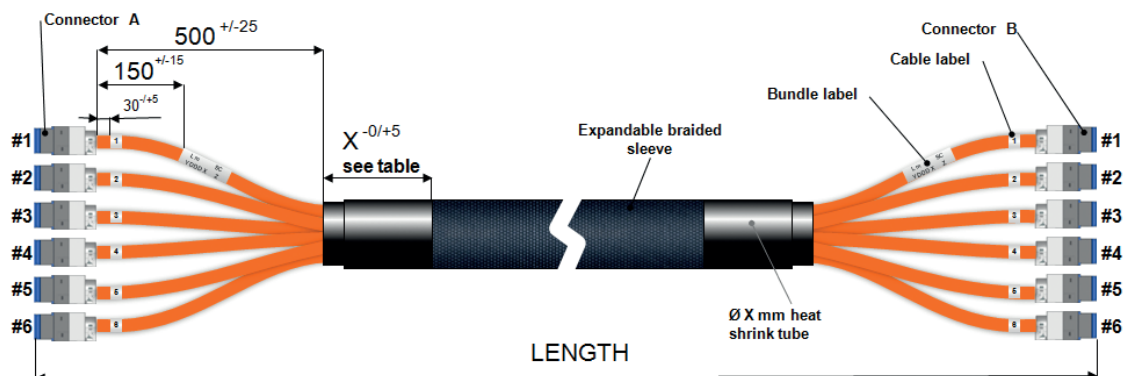
Jack-Plug



Plug-Plug

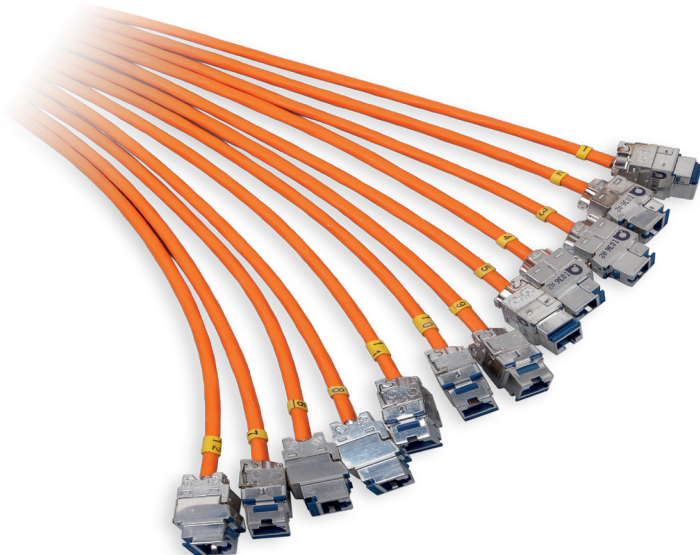


Bundles of Jack-Jack, Jack-Plug or Plug-Plug assemblies





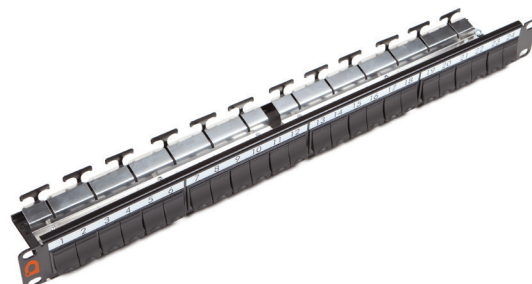
Single units from Aginode are cabled to form laid up bundles. This makes sure that connectors' alignment is maintained. This also makes the bundle more flexible and easier to install.



Modular patch panels

Patch Panel 24 Snap-In Fixed Black

- Compatible with all LANmark Snap-In connectors
- 24 Snap-In ports with shutters
- Clip-on mechanism avoiding the use of cable ties, gaining installation time
- Exclusive Auto-Connect earthing system
- Universal design supporting unscreened and screened connectors
- Also available in white



Patch Panel 24 Snap-In Sliding Black

- Sliding mechanism
- Compatible with all Snap-In connectors
- 24 Snap-In ports with shutters
- Clip-on mechanism avoiding the use of cable ties, gaining installation time
- Exclusive Auto-Connect earthing system
- Universal design supporting unscreened and screened connectors
- Fully painted design



Front access
to connectors

Reference	Description
N521.661BK	Patch Panel 24 Snap-In Fixed Black
N521.663BK	Patch Panel 24 Snap-In Sliding Black

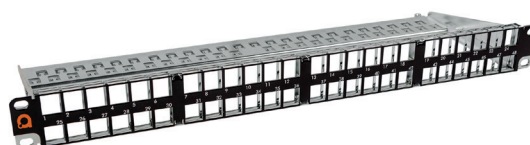
Angled Patch Panel 24 Snap-In Black

- Supports high density patching - ideal for Data Centres
- Eliminates the need for additional cable management
- Up to double density achievable
- Compatible with all Snap-In connectors
- Exclusive Auto-Connect earthing system
- Universal design supporting unscreened and screened connectors
- Also available in white



High Density Patch Panel 48 Snap-In 1U Black

- 48 ports on 1U saving 50% rack space
- Dedicated for LANmark-6A connectors
- Connectors in latch-up/latch-down position for ease of patching
- Port numbering on opposite side of latch for readability
- Robust construction to hold 48 cables
- Integrated cable management bar with cable tie slots
- Panel supplied as kit including 2 x 24 connectors



High
Density



48



Reference

Description

N521.671

Angled Patch Panel 24 Snap-In Black

N521.668KIT

LANmark Patch Panel 48 EVO 1U Black Kit with 48 Connectors

Modular patch panels

Universal Patch Guide with front cover, 1U Black

- Allows storage and management of copper and fibre patch cords
- 8 cm depth
- Cover for tidy cabinet look
- Black paint finished metal



Patch Guide with rings, 1U Black

- Allows storage and management of copper and fibre patch cords
- Open structure with rings for easy access
- 8 cm depth
- Black paint finished metal



Blank Panel, 1U Black

19" Blank Panel to fill empty cabinet space



Reference	Description
N521.672	Angled Blank Panel Black
N521.673	Angled Panel Cover Black
N521.678	Angled Pass-Through Black
N102.105BK	1U Patch Guide with rings, Black
N109.207BK	1U Blank Panel, black
N21MC24-1	1U Universal Patch Guide with front cover, Black

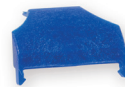
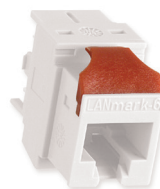
LANmark Coloured Shutters and Latch Protectors

- Available in 8 colours: white, black, blue, red, dark grey, green, yellow, orange
- Coloured shutters can be used to replace standard black or white versions on LANmark Snap-In patch panels, outlet modules and zone distribution boxes
- Coloured latch protectors can be used to replace pre-fitted standard black versions on LANmark patch cords
- Suitable for differentiation between various services or applications by colour coding, throughout the entire channel
- Sold in bags of 100 (shutters) and 50 (latch protectors)



Keystone Clips

- Adapter allowing LANmark Snap-In connectors to fit the Keystone format
- Metal clip for LANmark-7A GG45 connector only
- Plastic clips for all LANmark connectors including GG45 connector
- 3 different plastic clips available for different keystone aperture dimensions (height and wall thickness)



Reference	Description
N421.701XXX	LANmark Shutter 100x ("XXX" denoting colour: BLA = Black, BLU = Blue, DGR = Dark Grey, GRE = Green, ORA = Orange, RED = Red, YEL = Yellow, WHI = White)
N110.LPX	LANmark Latch Protector 50x ("X" denoting colour: K = Black, B = Blue, D = Dark Grey, G = Green, O = Orange, R = Red, Y = Yellow, W = White)
N429.620	Clips LANmark Keystone GG45
N429.625	LANmark Keystone Clip Evo (Wall Thickness 1.5-1.75) Red 24x
N429.626	LANmark Keystone Clip Evo (Wall Thickness 2.0-2.25) Blue 24x
N429.627	LANmark Keystone Clip Evo (Wall Thickness 2.0-2.25 Height 19.7) Yellow 24x

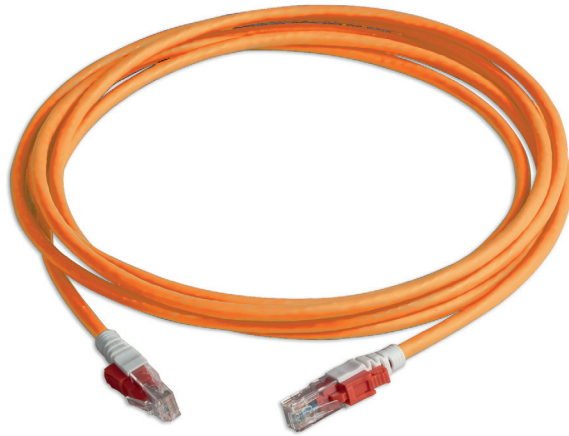
Secure lock RJ45 cords

The range of Secure Lock copper cords is designed to meet the needs of applications such as:

- PoE connector protection (damage caused by de-mating under load)
- Theft prevention (hotels/schools/libraries)
- Critical circuit protection
- Patch cord availability (meeting rooms)
- Redundant copper links
- Connection of IP security cameras

Secure Lock cords are Category 6A and are supplied in 2 versions: with two locking ends or with a single end. Once installed, the cord locks automatically and the plug tab becomes inaccessible. It can only be disconnected by pressing the key on the plug.

Standard cords have an orange LSZH jacket and are stocked in lengths of 1, 2, 3 & 5m - other lengths and cord colours are available on demand.



Tools & accessories

Hook & Loop Cable Strap 25m Roll

- High quality self-gripping cable tie
- Reusable multiple times
- Recommended to bundle and tie both copper and optical fibre data cables
- Reduces strain on cables compared to traditional cable fasteners
- 20mm width
- 25m roll



Comfort Tool

- Facilitates smooth termination of all LANmark Snap-In connectors
- Allows re-opening of all LANmark connectors (except GG45) allowing retermination



Easy Termination tool

- Prepares S/FTP cable for connection to LANmark-7A GG45 connector
- Makes LANmark-7 GG45 installation fast, easy and consistent



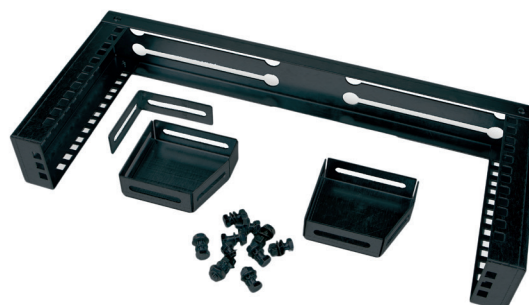
Set of spare blades for Easy Termination tool



Reference	Description
N100.100	Hook & Loop Cable Strap 25m Roll
N420.567	Tool – Universal Comfort tool for Snap-In connector
N422.117	Tool – LANmark-7 Easy Termination tool
N422.118	Tool – Set of spare knives for LANmark-7 Easy Termination tool

Overhead Patching Frame 4U and 6U

- 19-Inch 4U and 6U overhead frame
- Ideal in data centres
- Designed to host both copper and fibre cabling
- Metal construction
- Straight or angled position
- Black finished



Reference	Description
N345.400BCH	LANmark Overhead Patching Frame 4U, Black
N345.600BCH	LANmark Overhead Patching Frame 6U, Black

Pair of Patch Cord Management Hooks Black for Overhead Patching Frame 4U and 6U

- Required to guide patch cords on both sides of the frame
- Easy to mount with 2 screws and cage nuts
- Up to 3 hooks on each side
- Black flexible plastic



Reference	Description
N521.678	Angled Pass-Through Black
N345.401	Pair of Patch Cord Management Hooks Black for Overhead Patching Frame 4U and 6U

Fibre 

Copper 

AIM 

Support 

LANsense™

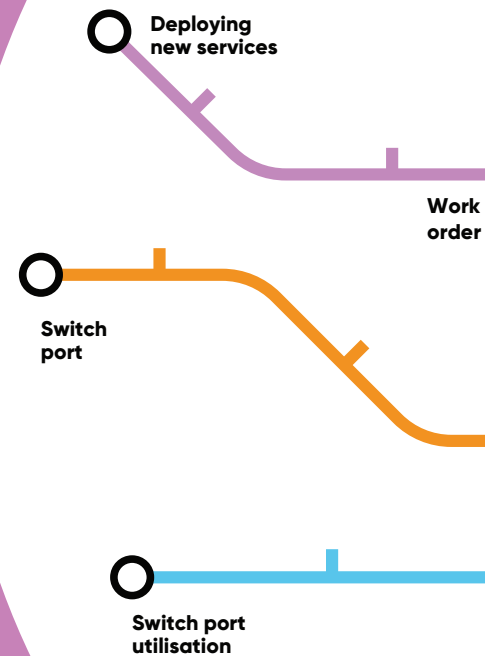
Automated Infrastructure Management

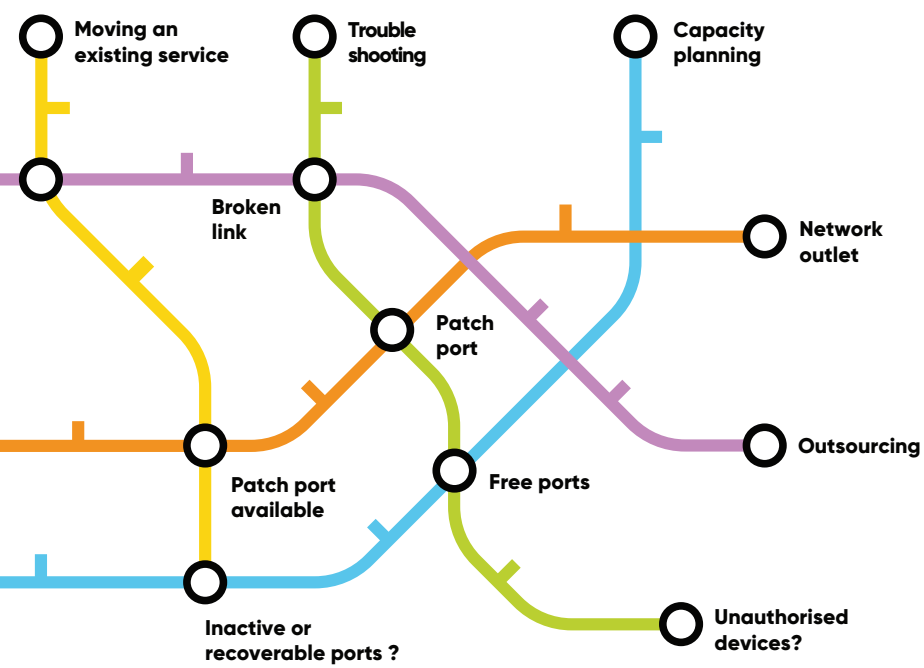


**More
Safety**



**Easy
detection**





Automated Infrastructure Management

A reliable LAN infrastructure that is well managed and monitored in real time is an essential component of any company's business. This need is driven by increasing complexity and continuous change, which are becoming virtually impossible to manage manually. LANSense is Aginode's Automated Infrastructure Management (AIM) solution. Also known as Intelligent Infrastructure Management (IIM).

Why LANSense in Data Centres?

Data centres are becoming increasingly complex in terms of infrastructure and networks.

In today's dynamic data centre environment, control and monitoring are crucial.

The initial cost of the cabling system and its associated infrastructure represents a small fraction of the overall costs of a data centre. But because of its long life relative to other active equipment, cabling is by far the most complex and expensive infrastructure to replace.

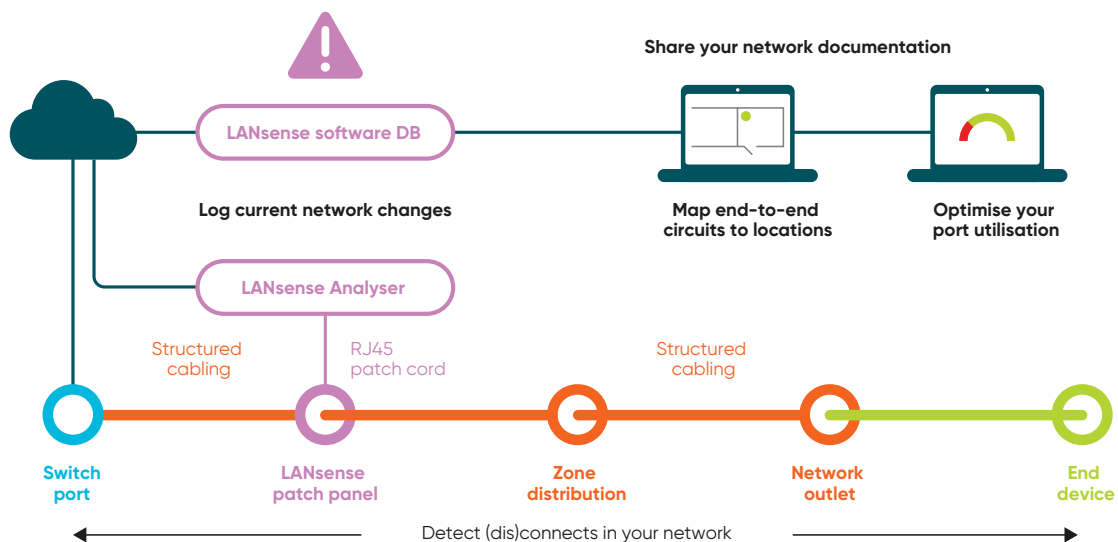
The multiplication of service providers hosted in data centres for customers, as well as the Cloud, generates an increased need to manage the physical installation and to control transfers, additions and changes (MACs). The initial documentation of the installed and tested infrastructure will surely be correct at the time of project delivery. But after that, it needs to be kept

up to date and well managed so that it remains reliable and accurate for planning future growth, energy efficiency, flexibility, availability and security.

How does LANSense help?

Aginode LANSense is an intelligent management system combining intelligent hardware and software. This platform combines information on physical layer and network connections. It provides a complete traceable path between the core, the periphery and the end devices. The software instantly updates the management database when changes or unauthorised connections/disconnections are detected. It also establishes a reliable audit trail to ensure compliance and compliance with legal obligations.

LANSense provides an additional level of security by detecting unauthorised equipment connections on the network, tracing the physical path of this equipment and locating it on the layout plan. LANSense also helps you make informed decisions to make better use of assets and resources, for example by showing how much space is available in racks, which patch panel ports are free, the different VLANs, which switch ports can be reclaimed and much more. The system automatically updates the documentation as soon as it is set up and is 100% correct.



LANsense TGA: LANsense Third Generation Analyser

LANsense TGA: A LANsense analyser is required to monitor all network ports, record changes in the events log, and continuously update and maintain the connectivity database. It connects to the equipment presentation panel and the horizontal distribution panel using RJ45 cords, and is in turn connected to the LANsense cable management SQL database.

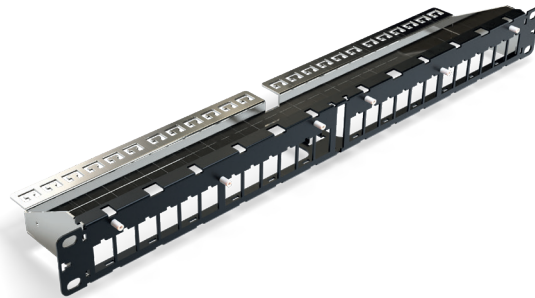


LANsense Patch Panels

Patch panels incorporate sensor circuits to detect the insertion or removal of cords.

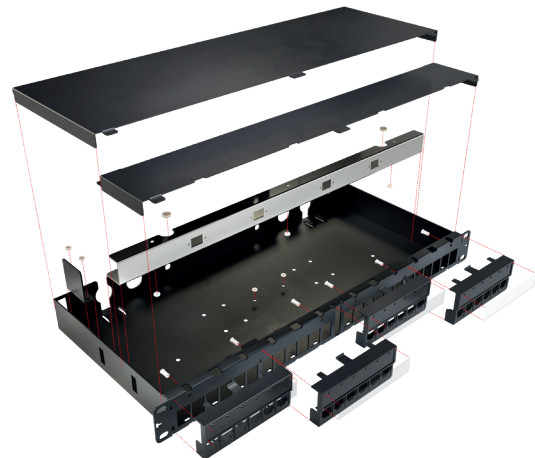
Patch Panel 24 ports Snap-In Fixed Black

- Compatible with all LANmark Snap-In Connectors
- 24 Snap-In ports
- Automatic connection detection
- Clip on Mechanism
- Universal design supporting unscreened and screened connectors
- Printed numbering for port identification



LANsense Sliding Fibre Panels

- Optical panel for rapid installation in data centres
- Dust cover to detect connections
- 2 versions of fibre panels:
Panels equipped with LC: 48 LC ports multimode or singlemode
Panels with MPO connector on rear and LC ports on front : 48 multimode or singlemode LC ports
- Sliding and tilting patch panel for easy installation, upgrading and maintenance
- Optimised hinged trays for optimum cable bending radius
- Marking system for port identification and patch cord management



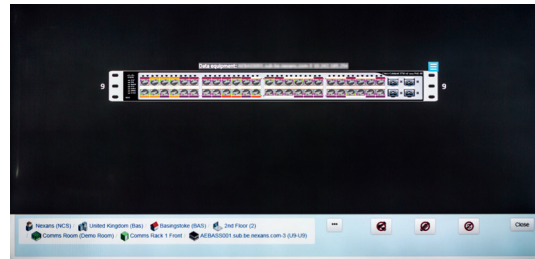
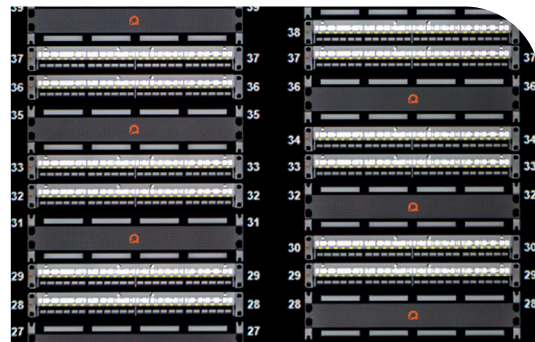
LANsense Software

The new LANSense software is 64 Bit safe and secure web based application. It communicates with the LANSense analyser, which monitors physical change, over TCP/IP and update the database providing real time, 100% reliable and accurate automated documentation of physical infrastructure.

Graphical View

Real time updated graphical view of cabling infrastructures in Data Centres and Equipment Rooms like :

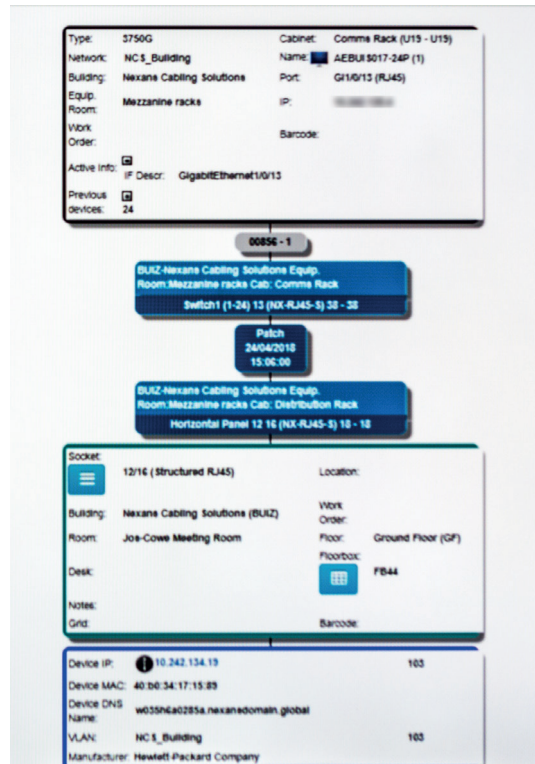
- Cabinets/Racks
- Networking Switches
- LANmark and LANSense Patch Panels
- Patch Connectivity information
- Live Switch port and connectivity information



Circuit Trace

LANSense provides real time circuit trace between Servers and End devices and the switch ports like:

- Information about the switch port, VLAN, IP/MAC address of the switch
- Information on the Location of the physical infrastructure like Patch Panels, Rack/Cabinets, Networking Equipment, Servers, End Devices
- Information on the Networking Equipment's, Servers, End Devices -IP/ MAC address, VLAN and DNS name

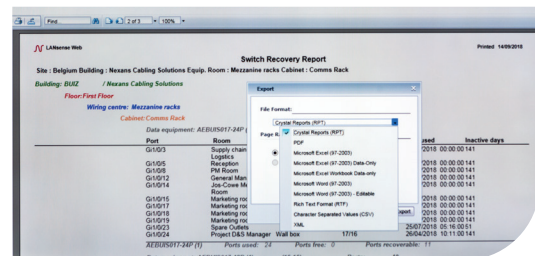


Reports

LANSense comes with pre-defined set of useful reports that can be generated on :

- Locations
- Connectivity
- Work orders
- Logs

LANSense reports are customizable and can also be configured by the user depending on his needs.



Floors planners

LANsense Planners is an interactive tool for locating physical assets or equipment on a floor plan.

Floor plans of data centres, small equipment rooms or a building floor can be used.

This tool displays information on available space units and total power consumption per cabinet.

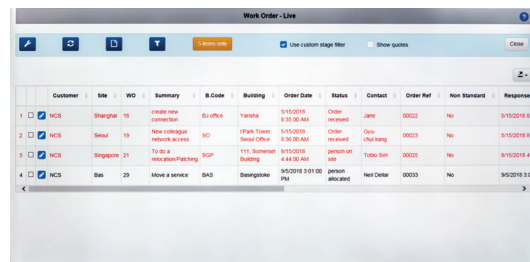
Other essential elements of data centres, such as uninterruptible power supplies and heating-ventilation-air-conditioning systems, can be documented on the layout plans, even if they are not part of the LANsense system.



Work orders

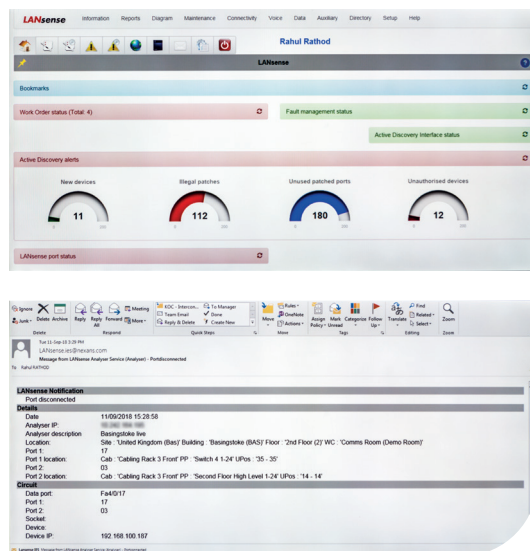
LANsense work orders are used for maintenance and management of network providing :

- Service Level Agreements
- Automatic Email configurations at different work order stages
- History of work orders and reporting



Dashboards, Email Notification and Logs

- LANsense software provides a quick and simplified overview on the status of the network
- Immediately alerts users via email notification on occurrence pre-defined activities and events.
- Logs about various events and activities are maintained which are useful for monitoring and audit purpose



Integration Capabilities:

- LANsense allows you to integrate and communicate with third party software's and Hardware.

ENGAGE

Support





Training

In order to provide end users with maximum confidence, Aginode Certified Solution Partners (CSP) must pass training to ensure they are competent to install LANmark solutions to the required standard and are able to offer the full Certified Solution Warranty.

Courses are typically based on the following formats although training may vary slightly by country depending on local requirements and needs. These programmes are all based on standardised Training Modules to ensure consistency of standards around the globe.

Contact us to get details of training courses in your region: info@aginode.net.

Training Modules Overview

Module 1	Premises Cabling Standards *
Module 2	Parameters for Copper Cabling *
Module 3	Aginode LANmark Copper Cabling Solutions *
Module 4	Installation Rules and Guidelines *
Module 5	Installation Practice & Testing Class D-E-EA Links *
Module 6	Installation Practice & Testing Class F-FA Links
Module 7	Optical Fibre Theory and Principles *
Module 8	Aginode LANmark Optical Fibre Cabling Solutions *
Module 9	Fibre Installation Practice with Direct Termination
Module 10	Fibre Installation Practice on Fusion Splicing Module 11 Testing Optical Fibre Links *
Module 12	Fibre To The Office (FTTO)

* Module part of the 3 Day Supervisor/Expert Training Program

E-Learning

Aginode E-learning enables partners to follow parts of the Aginode training online and receive certifications which will reduce the amount of in-class training required.

Visit the website and check the news for announcements on availability in your region by selecting your country at www.Aginode.com/LANsystems

Warranty

Fully comprehensive or self-certification options

Link Warranty

On-line self-certification

Aginode provides a unique 25 year self-certification Link Warranty for standard Cat 6 and Cat 6A installations – available for all installers.

- Instant certification – no waiting while application is processed
- Customised – certificate includes details of end customer and installer
- Easy – simply complete the short online form, generate and print the pdf certificate

Certified Solution Warranty

Complete confidence

Aginode Certified Solution Warranty is the most comprehensive guarantee on the market covering:

- Copper and Fibre
- Channel Performance – Horizontal, Campus and Backbone
- Application support
- Labour*

What is included	Link warranty certificate	Certified solution warranty
Brands covered :		
LANmark	✓	✓
Essential	✓	-
Copper categories covered :		
Cat 6	✓	✓
Cat 6A	✓	✓
Cat 7A	-	✓
Fibre	-	✓
Parts	✓	✓
Link performance	✓	✓
Full end-to-end channel	-	✓*
Application guarantee	-	✓*
Extended distance support	-	✓*
Installation liability	-	✓**
Aginode checked & validated validity	-	✓
Validity	25 years	25 years

* using LANmark patch cords

** when installed by a Certified Solutions Partner

Installer Programs



Certified Solution Partner (CSP)

CSP's are fully approved and validated by Aginode and are qualified to offer the fully comprehensive Certified Solutions Warranty.



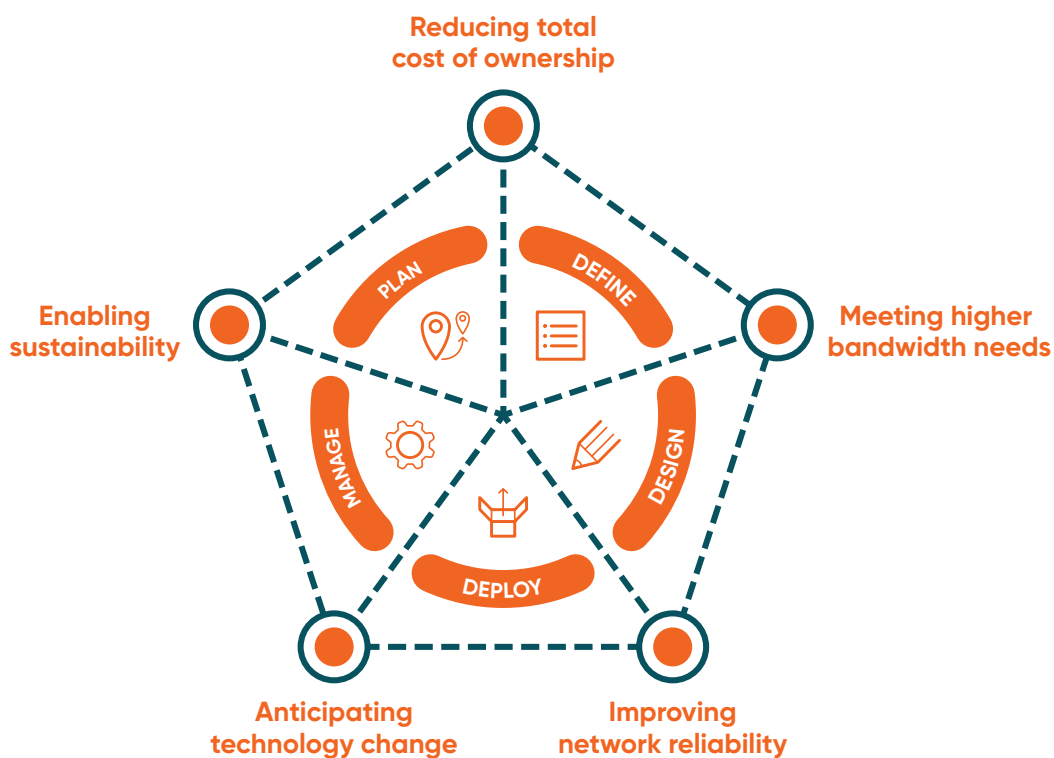
ENGAGE

Our ENGAGE partners are our premier tier, exclusively selected to help deliver this commitment to our final clients.



Registered Installer (RI)

Available to all applicants, RI's benefit from latest updates and can offer the self-certified online Link Warranty.



ENGAGE

Engage' embodies Aginode's commitment to helping its customers at every stage of IT infrastructure implementation: from planning to defining requirements', through design to deployment and use of the cabling infrastructure.



Plan

Keeping you up-to-date on latest innovations, helping you to plan ahead for future changes.

- Technology updates & insights
- Newsletter #smartconnection
- Peer-to-peer network
- Strategy support / specialist knowledge /outlook
- International roll-out



Define

Sharing our expertise in defining state-of-the- art specifications and solutions.

- Solution specifications
- Cabling categories and grades, standards and systems
- Project outlines
- Scope of Work, project planning and certified partner selection
- Bill of materials
- Requirements review, product catalogue and stock listing
- Customer catalogue

Design



Supporting you in designing robust, flexible and scalable systems

- Infrastructure design support
- Floor, room, cabinet and patching diagrams
- Proof of concepts
- Starters kits and simulated installation mockups in Lab
- Product customisation and development
- End-user training



Deploy

Blueprinting your infrastructure for cost- effective and accurate installation, assisting you on-site and ensuring warranties.

- Preconfigurations
- Pre-terminated assembly, tailor-made labeling and detailed deployment guidelines
- Logistics
- Contractor distribution channel management
- Single point of contact
- On-site assistance
- Toolkit training, surveys, partner training and support
- On-site audits
- Parts & applications warranty and labour warranty

Use



Offering training, monitoring and fast repair, replacement and third-level support.

- System monitoring
- MAC
- Repair Services
- Hardware Replacement Services
- Third-Level Support Service incl.
- Software update services
- Local support service
- Support portal

All drawings, designs and specifications contained in this document is indicative only and shall not be binding on Aginode or be treated as constituting a representation on the part of Aginode.

#smartconnection



Contact us via
info@aginode.net

www.aginode.net

