

Netscale Solutions

Delivering the highest
10/40/100GbE density of
any fiber solution out there

Get more

Density

World's densest fiber solution

Manageability

Unmatched cable management

Visibility

Automated documentation

Netscale Solutions.

Introduction.

The next-generation

For some people it is just a mere detail behind sophisticated technologies. For R&M, fiber optic infrastructures are a promise in high performance connectivity, superior quality standards with high-end manufacturing processes, and guaranteed tested products.

“Netscale has arisen from the close analysis of customer pain points”

R&M thinks high density is not simply about the number of ports per rack unit. Rather, user-friendly cable management and flexible modularity are the aspects that improve real-world network tasks. Modular systems should exactly be this – modular. That is why R&M has developed a patent pending polarity management method that yields minimally disruptive migration paths to parallel optics applications.

Netscale in name. Netscale in nature.

R&M Netscale solutions combine unmatched fiber cable management with automated connectivity tracking and an innovative tray design to deliver the world's highest port density for 10/40/100G Ethernet.

Most existing high-density fiber solutions for data centers offer up to 72 LC duplex ports per rack unit and pose great difficulties for management. Thanks to R&M *IntelIPhy* technology, Netscale delivers a density of up to 80 RFID-monitored LC-duplex or MPO ports, and even 120 standard LC duplex or MPO ports per rack unit.

The innovative rear-cabling manager ultimately makes it truly easy to manage connections, alleviating risk during MACs and migrations. Its modular components and best-in-class network scalability accommodate the fact that each data center has its unique infrastructure requirements.





Netscale Solutions. Housing.



The Netscale housing is mountable in 19-in racks or cabinets and provides user-friendly and flexible ultra high-density connectivity when combined with Netscale modules, cassettes, harnesses, trunks and Netscale patch cords.

The elaborate design of Netscale housings includes drawers receiving modules or cassette from either the front or the rear. A fundamental design feature is the break-up of traditional RU-sizing. Netscale drawers are only 0.75RU high which allows the 3RU housing to host four of them and hence, increase the density.

The Netscale housing also provides the infrastructure fundament for R&M *IntelliPhy*, the automated infrastructure management solution.

Ordering Information

Article Number	Description	Height Unit	Number of cassettes/modules per housing
828643	Housing for any server rack, network racks and open frames	1	5
828644	Housing for any server rack, network racks and open frames	3	20
826602	Housing for ≥800mm wide racks without air partitioning	1	5
826603	Housing for ≥800mm wide racks without air partitioning	3	20



828643



828644



826602



826603

Netscale Solutions.

Rear-Cabling Manager.



The rear-cabling manager (RCM for MPO and LC trunk cables is specially designed to address both slack management and documentation of trunk cables in the back-side of the Netscale housing. It accepts incoming trunk cables from the back for each individual insert (either module or cassette) to improve installation times.

The RCM comprises up to two divider snap-on clips at the rear which enable fast and easy installation and strain-relief of trunk cables. It allows for the slack management of trunk legs and ensures a minimum bend radius of 20 mm. It also has a documentation area at the back to improve label visibility of trunk cables.

For an R&M *IntelPhy* adaption, it provides a separate slack management for an optional bus cable coming from the RFID-sensor system.

Ordering Information

Article Number Description

827348	Rear-cabling manager (RCM)
815875	RCM Support Tray



827348



815875



Netscale Solutions.

Accessories.

Ordering Information

Article number	Product description
NC-BLBLBLNA--N-	Blank insert , covers empty slots within Netscale drawers
827350	Size 1 snap-on clip, 25 units
827352	Size 2 snap-on clip, 25 units
826609	1RU strain-relief bracket for accommodating four snap-on clips for trunks at rear post when RCM is not deployed
826610	3RU strain-relief bracket for accommodating 16 snap-on clips for trunks at rear post when RCM is not deployed
826607	Housing support bracket



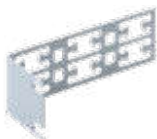
NC-BLBLBLNA--N-



827350



827352



826609



826610



826607



Netscale Solutions.

LC-Duplex to MPO Modules.

Netscale LC-Duplex to MPO modules provide the interface between the male MPO connectors on the trunk and the LC-Duplex patch cords that will then connect directly into the transceiver modules. It can either contain 12 or 18 LC-Duplex ports. The LC-Duplex ports feature integrated laser shutters that move out of the way when the connector is inserted.

R&M's Type S LC-Duplex to MPO modules ensure correct fiber polarity while requiring just one type of patch cord on both ends of the link. The crossover of the fibers for duplex signal transmission takes place within the module. The connectivity diagram for the trunk cable and patch cord remains the same all the time, even for parallel transmission for setting up 40/100 GbE installations.

The sum of LC-Duplex ports is divided into Tx and Rx so that all Tx fibers run to one MPO and all Rx fibers to the other MPO. These MPOs connections can be bundled into a single trunk. The system is mated key-up to key-down. Symmetric cabling according to TIA-568-C Method B for 10G, 40G and 100G, as well as 8G and 16G Fibre Channel is therefore enabled in collaboration with type B trunks. By using type A trunks, Method A is established. That means capacity can be expanded directly in an uncomplicated and inexpensive manner.

“The 12 port versions can be retrofitted with the RFID-sensor system for R&MinteliPhy.”

Ordering Information

Article Number	Adapter Type Front	Adapter Color Front	Number of ports in front	Adapter Type Back	Number of ports in Rear	Fiber Category	Rear-Cabling Manager included	R&MinteliPhy-retrofittable
NM-LDBLLDMM1F-YS	LC-Duplex	Black	12	MPO	2	OM4	Yes	Yes
NM-LDBLLDMM1F-NS	LC-Duplex	Black	12	MPO	2	OM4	No	Yes
NM-LDLDL DMM1F-YS	LC-Duplex	Black	18	MPO	3	OM4	Yes	No
NM-LDLDL DMM1F-NS	LC-Duplex	Black	18	MPO	3	OM4	No	No
NM-LDBLLDSM1F-YS	LC-Duplex	Blue	12	MPO	2	OS2	Yes	Yes
NM-LDBLLDSM1F-NS	LC-Duplex	Blue	12	MPO	2	OS2	No	Yes
NM-LDLDLDSM1F-YS	LC-Duplex	Blue	18	MPO	3	OS2	Yes	No
NM-LDLDLDSM1F-NS	LC-Duplex	Blue	18	MPO	3	OS2	No	No

Netscale Solutions.

QSFP+ Conversion Modules.

Netscale QSFP+ conversion modules have 12-fiber MPO (MPO12) adapters in the rear for mating to trunks and breakout to 8-fiber MPO (MPO8) adapters in the front for equipment connectivity. The conversion modules fully utilize all fibers in each MPO12 set in the trunk by breaking out MPO12 adapters at the rear of the module into a proportionate number of MPO8 adapters at the front.

Netscale QSFP+ conversion modules are available in two configurations: 8x12 (eight 12-fiber MPO adapters in the rear and twelve 8-fiber MPO adapters in the front) and 12x18 (twelve adapters in the rear and 18 in the front).

All modules come from the factory as a Type S component and feature non-pinned MPO12 in the rear.



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“The 12 port versions can be retrofitted with the RFID-sensor system for R&MinteliPhy.”

Ordering Information

Article Number	Adapter Type Front	Number of ports in front	Number of ports in Rear	Fiber Category	Rear-Cabling Manager included	R&MinteliPhy-retrofittable
NM-1MBL1MMM1F-YS	Black	12	8	OM4	Yes	Yes
NM-1MBL1MMM1F-NS	Black	12	8	OM4	No	Yes
NM-1M1M1MMM1F-YS	Black	18	12	OM4	Yes	No
NM-1M1M1MMM1F-NS	Black	18	12	OM4	No	No

Netscale Solutions.

Adapter Cassettes.

Netscale adapter cassettes are pass-through inserts with LC-Duplex or MPO adapters. The LC or MPO trunk cables connect at the rear of the adapter cassettes. From the front side, various options are possible, ranging from LC-duplex or MPO patch cords for equipment connections over harness cables to cross-connection used in main distribution areas (MDA).

Like Netscale modules, cassettes can be installed from the front or rear of any Netscale housing. Netscale adapter cassettes are available with 12 and 18 adapters for multimode and singlemode applications. Like all Netscale inserts, the 12 port versions of the adapter cassettes can be retrofitted with the RFID-sensor system of R&MinteliPhy.

Ordering Information

Article Number	Adapter Type	Adapter Color	Number of ports	Rear-Cabling Manager included	R&MinteliPhy-ready
NC-LDBLLDMM--Y-	LC-Duplex	Black	12	Yes	Yes
NC-LDBLLDMM--N-	LC-Duplex	Black	12	No	Yes
NC-LDLDLMM--Y-	LC-Duplex	Black	18	Yes	No
NC-LDLDLMM--N-	LC-Duplex	Black	18	No	No
NC-LDBLLDSM--Y-	LC-Duplex	Blue	12	Yes	Yes
NC-LDBLLDSM--N-	LC-Duplex	Blue	12	No	Yes
NC-LDLDLDSM--Y-	LC-Duplex	Blue	18	Yes	No
NC-LDLDLDSM--N-	LC-Duplex	Blue	18	No	No
NC-M1ABLM1ANA--Y-	MPO	Black	12	Yes	Yes
NC-M1ABLM1ANA--N-	MPO	Black	12	No	Yes
NC-M1AM1AM1ANA--Y-	MPO	Black	18	Yes	No
NC-M1AM1AM1ANA--N-	MPO	Black	18	No	No

Netscale Solutions.

Optical Performance.

Multimode

	Max. Insertion Loss Connector A (dB)	Return Loss Connector A (dB)	Max. Insertion Loss Connector B (dB)	Return Loss Connector B (dB)
MPO Trunks	0.3	≥ 35	0.3	≥ 35
Netscale Patch Cords	0.15	≥ 35	0.15	≥ 35
MPO Patch Cords	0.3	≥ 35	0.3	≥ 35
MPO-LC Fanouts	0.3	≥ 35	0.15	≥ 35
QSFP+ Conversion Cables	0.3	≥ 35	0.3	≥ 35
SFP+ Conversion Cables	0.3	≥ 35	0.15	≥ 35

Multimode

	Max. Insertion Loss Connector A (dB)	Return Loss Connector A (dB)	Max. Insertion Loss Connector B (dB)	Return Loss Connector B (dB)
MPO Trunks	0.35	≥ 35	0.35	≥ 35
Netscale Patch Cords	0.25	≥ 35	0.25	≥ 35
MPO-LC Fanouts	0.35	≥ 35	0.25	≥ 35

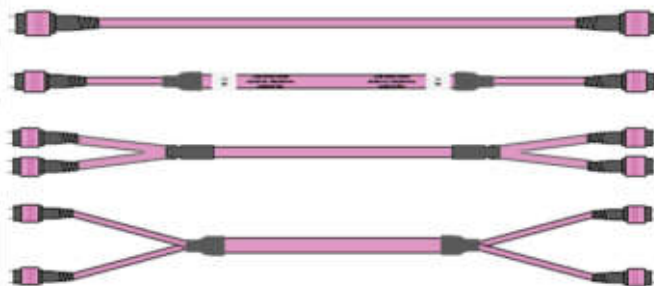
Mechanical Characteristics

Fiber Count	Outer Diameter (mm)	Weight (kg/km)	Min. Bend Radius Installation (mm)	Min. Bend Radius Operation (mm)	Max. Tensile Strength Installation (N)
12	3.0	9	30	30	200
24	3.6	11	35	35	200
36	6.8	35	50	50	1000
48	6.8	40	50	50	1000
72	7.5	50	50	50	1000
96	8.5	60	50	50	1000
144	9.0	70	60	60	1000

Netscale Solutions.

MPO Trunks.

MPO trunks are pre-terminated cables with one or more 12-fiber MPO connectors on both ends. Trunks are purpose made for high density backbone connections between cabinets or zones in the data center. R&M's MPO trunks conform with TIA-568 C.O Types A or B polarity. Fast traceability is guaranteed with color coded jackets (OM4 - heather violet, OM3 - aqua, OS2 - yellow).



Ordering Information

FA-	L				-			-	N	L			-			-	N	L			-			N
		1	2	3		4	5				6	7		8	9				10	11		12	13	

- 1** Choose fiber count
 12 = 12 fibers
 24 = 24 fibers
 48 = 48 fibers
 72 = 72 fibers
 E4 = 144 fibers

- 2** Choose fiber type
 S2Y = singlemode (OS2)
 M3T = multimode (OM3)
 M4H = multimode (OM4)

- 3** Choose jacket type
 S = standard jacket
 D = ruggedized jacket

- 4** Choose connector on end A
 1M = male 12 fibers MTP
 1F = female 12 fibers MTP

- 5** Choose polish angle
 0 if multimode
 8 if singlemode

- 6** Choose staggering scheme
 05 = fanout length 0.5 m
 08 = fanout length 0.8 m
 10 = fanout length 1.0 m
 20 = fanout length 2.0 m
 S1 = Suited for RCM

- 7** Choose grip scheme on end A
 P = with grip
 O = without grip

- 8** Choose connector on end B
 1M = male 12 fibers MTP
 1F = female 12 fibers MTP

- 9** Choose polish angle
 0 if multimode
 8 if singlemode

- 10** Choose staggering scheme
 05 = fanout length 0.5 m
 08 = fanout length 0.8 m
 10 = fanout length 1.0 m
 20 = fanout length 2.0 m
 S1 = Suited for RCM

- 11** Choose grip scheme on end B
 P = with grip
 O = without grip

- 12** Choose polarity
 A = Type A
 B = Type B

- 13** Choose cable length from endface to endface
 1.1 - 999 m

Netscale Solutions.

Netscale Patch Cords.

The Netscale patch cord features an innovative push-pull design with a textured boot to ensure easy access to and removal of the connector. It also allows for quick tool-less polarity reversal. Of special interest is the industry-leading 1.4 mm cable diameter design that enables unmatched ease of management in high density rack and panel configurations, as compared to legacy cords with diameters of 2 mm or more. And of course, it can be equipped with an R&MinteliPhy RFID-tag.

“Netscale utilizes the LC-quick release connector and smallest diameter uniboot patch cords for minimal cabling bulk.”



Ordering Information

PA-	2		14-	LU				N	LU				N			N
		1				2	3			4	5		6	7		

- | | | |
|---|--|--|
| 1 Choose fiber type
S2YL = singlemode (OS2)
M3TR = multimode (OM3)
M4HV = multimode (OM4) | 2 Choose polishing of connector A
0 if multimode
8 if singlemode | 4 Choose polishing of connector B
0 if multimode
8 if singlemode |
| | 3 Choose grade of connector A
A = Grade Am, multimode
C = Grade C, singlemode | 5 Choose grade of connector B
A = Grade Am, multimode
C = Grade C, singlemode |
| | | 6 Choose polarity
A = A-A
B = A-B |
| | | 7 Choose cable length from
endface to endface
00.1 – 999 m |

Netscale Solutions.

MPO Patch Cords.

MPO patch cords are directly connected with QSFP+ transceivers to allow 40G Ethernet transmission over a fiber optic link. When used in conjunction with MPO trunks and MPO cassettes, this female 12-fiber MPO patch cords allow for easy migration to parallel optics.



Ordering Information

FA-	L	12		S	-	1F	0	-	N	L	0	O	-	1F	0	-	N	L	0	O	-	B		N
			1																				2	

- 1
- Choose fiber type
M3T = multimode (OM3)
M4H = multimode (OM4)

- 2
- Choose cable length from
endface to endface
1.1 – 150 m

Netscale Solutions.

MPO-LC Fanouts.

MPO-LC Fanouts combine MPO connectors that can be plugged either into MPO cassettes or LC-to-MPO modules, and LC-Duplex connectors that connect directly into SFP+ transceivers. This setup can be employed as an interconnect solution for port replication on the LC-to-MPO module.



Ordering Information

FA-	L				-		0	-	N	L			-	LU	0		N				-	B		N
		1	2	3		4					5	6			7		8	9	10				11	

1 Choose fiber count
 12 = 12 fibers
 24 = 24 fibers
 48 = 48 fibers
 72 = 72 fibers
 E4 = 144 fibers

2 Choose fiber type
 M3T = multimode (OM3)
 M4H = multimode (OM4)

3 Choose jacket type
 S = standard jacket
 D = ruggedized jacket

4 Choose connector on end A
 1M = male 12 fibers MTP
 1F = female 12 fibers MTP

5 Choose staggering scheme
 05 = fanout length 0.5 m
 08 = fanout length 0.8 m
 10 = fanout length 1.0 m
 20 = fanout length 2.0 m
 S1 = Suited for RCM

6 Choose grip scheme on end A
 P = with grip
 O = without grip

7 Choose grade of LC Duplex
 A = Grade A
 B = Grade B

8 Choose fanout diameter
 S = 0.9 mm
 M = 2.0 mm

9 Choose staggering scheme
 05 = fanout length 0.5 m
 08 = fanout length 0.8 m
 10 = fanout length 1.0 m
 20 = fanout length 2.0 m
 S1 = Suited for RCM

10 Choose grip scheme on end B
 P = with grip
 O = without grip

11 Choose cable length from
 endface to endface
 1.1 – 150 m (standard jacket)
 1.1 – 400 m (ruggedized jacket)

Netscale Solutions.

QSFP+ Conversion Cables.

The QSFP+ conversion cable is a pre-terminated solution allowing networks to 100% utilize MPO trunks based on 12 fibers when migrating to 40G, which uses technology based on 8 fibers (four fibers transmitting at 10G in each direction). Without this conversion, data centers running 40G parallel optics on their existing fiber backbone only use 66 percent of the installed fiber and waste a third of their invested capital.



Ordering Information

FA-	L	24			C		0	-	N	L			-		0	-	N	L			-			N
			1	2		3				4	5		6				7	8		9	10			

1 Choose fiber type
M3T = multimode (OM3)
M4H = multimode (OM4)

2 Choose jacket type
S = standard jacket
D = ruggedized jacket

3 Choose connector on end A
1M = male 12 fibers MTP
1F = female 12 fibers MTP

4 Choose staggering scheme
05 = fanout length 0.5 m
08 = fanout length 0.8 m
10 = fanout length 1.0 m
20 = fanout length 2.0 m
S1 = Suited for RCM

5 Choose grip scheme on end A
P = with grip
O = without grip

6 Choose connector on end B
1M = male 12 fibers MTP
1F = female 12 fibers MTP

7 Choose staggering scheme
05 = fanout length 0.5 m
08 = fanout length 0.8 m
10 = fanout length 1.0 m
20 = fanout length 2.0 m
S1 = Suited for RCM

8 Choose grip scheme on end B
P = with grip
O = without grip

9 Choose polarity
B = Type B
S = Type S

10 Choose cable length from
endface to endface
1.1 – 150 m (standard jacket)
1.1 – 400m (ruggedized jacket)

Netscale Solutions.

SFP+ Conversion Cables.

SFP+ conversion cables aggregate four 10G SFP+ transceiver modules with LC-Duplex ports in a 40G QSFP+ transceiver with an MPO port.



Ordering Information

FA-	L	8		S	C		0	-	N	L			-	LU	0		N				-	B		N
			1			2					3	4			5		6	7	8			9		

- 1 Choose fiber type
M3T = multimode (OM3)
M4H = multimode (OM4)
- 2 Choose connector on end A
1M = male 12 fibers MTP
1F = female 12 fibers MTP
- 3 Choose staggering scheme
05 = fanout length 0.5 m
08 = fanout length 0.8 m
10 = fanout length 1.0 m
20 = fanout length 2.0 m
S1 = Suited for RCM
- 4 Choose grip scheme on end A
P = with grip
O = without grip
- 5 Choose grade of LC Duplex
A = Grade Am
B = Grade Bm
- 6 Choose fanout diameter
S = 0.9 mm
M = 2.0 mm
- 7 Choose staggering scheme
05 = fanout length 0.5 m
08 = fanout length 0.8 m
10 = fanout length 1.0 m
20 = fanout length 2.0 m
S1 = Suited for RCM
- 8 Choose grip scheme on end B
P = with grip
O = without grip
- 9 Choose cable length from endface to endface
1.1 – 150 m

Netscale Solutions.

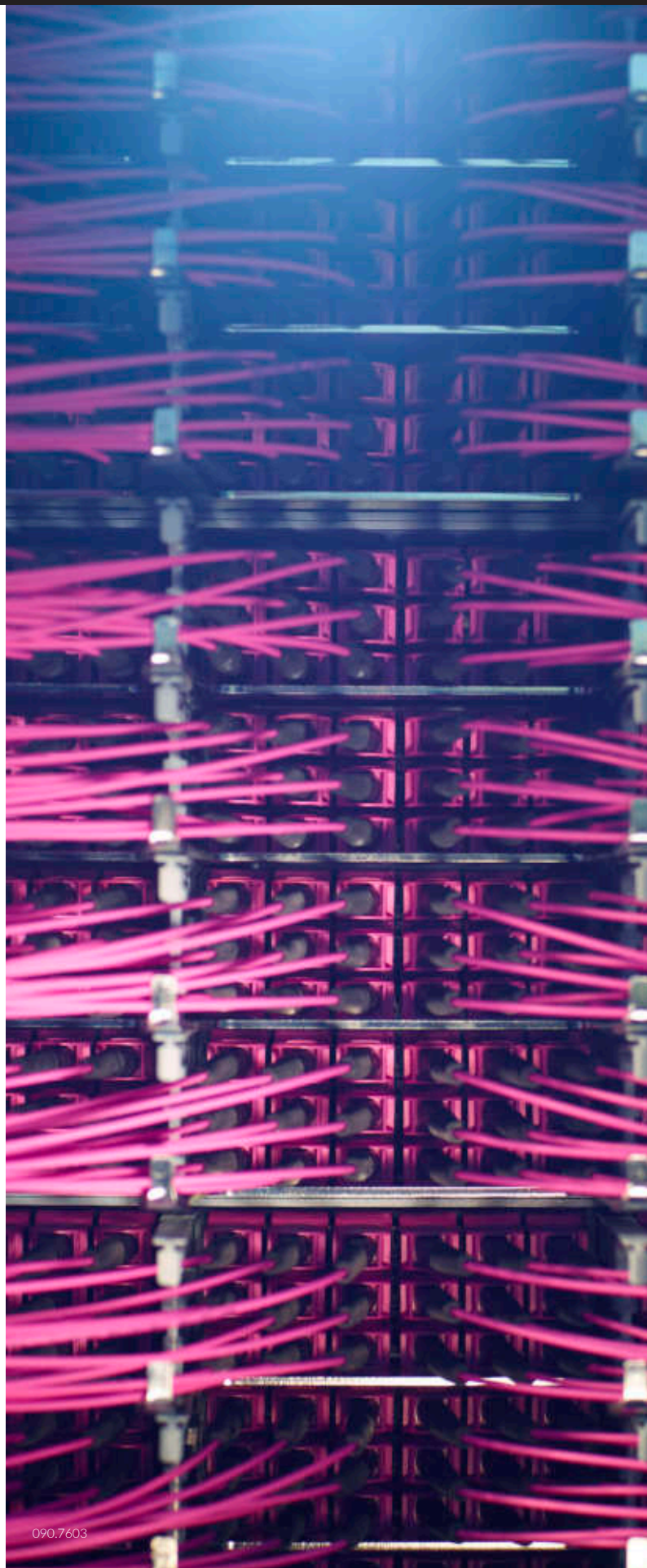
Cleaning Products.

Studies have shown that 80 to 90 percent of all transmission problems in optical networks are caused by dirty connectors. As a rule, every connector must be checked and cleaned, before it is plugged in. The same applies to new and unused patch cords or cable assemblies



Ordering Information

Article Number	Description
319903	Cleaning Kit Case FO
319904	Cletope Cleaning Spare Cassette
319906	Cleaning Wipes (10x10 cm)
319901	Ferrule Mate, 1.25 mm, for LC
803932	IBC Brand Cleaner, MPO in adapters
803931	Reel Cleaner, MPO connectors
803933	Reel Cleaner Spare Cleaning Tapes, 6x



Netscale Solutions.

R&MinteliPhy.

R&MinteliPhy opens up a new era for IT managers. Now, they can manage their physical infrastructure intelligently and fully automatic. Notepads are things of the past, as are hard-to-manage tables. With R&MinteliPhy, data centers immediately improve the capacity utilization, profitability and availability. IT managers gain control over all ports and more. This is because R&MinteliPhy helps with analysis and documentation, with the introduction of standardized processes and with all typical management tasks associated with passive infrastructure. For further information regarding additional hardware and the R&MinteliPhy software, please refer to R&MinteliPhy Quickreference.

“Capacity management is becoming an increasingly important topic for infrastructure and network managers.”

Ordering Information

Article Number	Description
824369	Sensorbar for one individual Netscale™ module or cassette
824370	Control unit PCU
827357	RFID Clips for Netscale patch cords, 10 pairs
809352	RFID Clips for MPO patch cords



824369



824370



827357



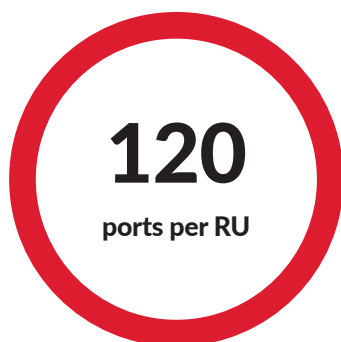
809352

Netscale Solutions.

In a nutshell.

ENJOY THE NUMBERS.

DENSITY



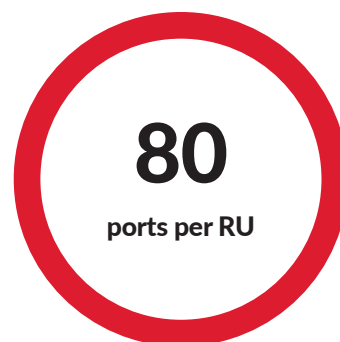
up to 67% higher than
industry standard

MANAGEABILITY



diameter of uniboot patch
cord reduces cabling
bulk volume by up to 56%

VISIBILITY



can be monitored with
R&MinteliPhy™ technology

Connectivity that matters

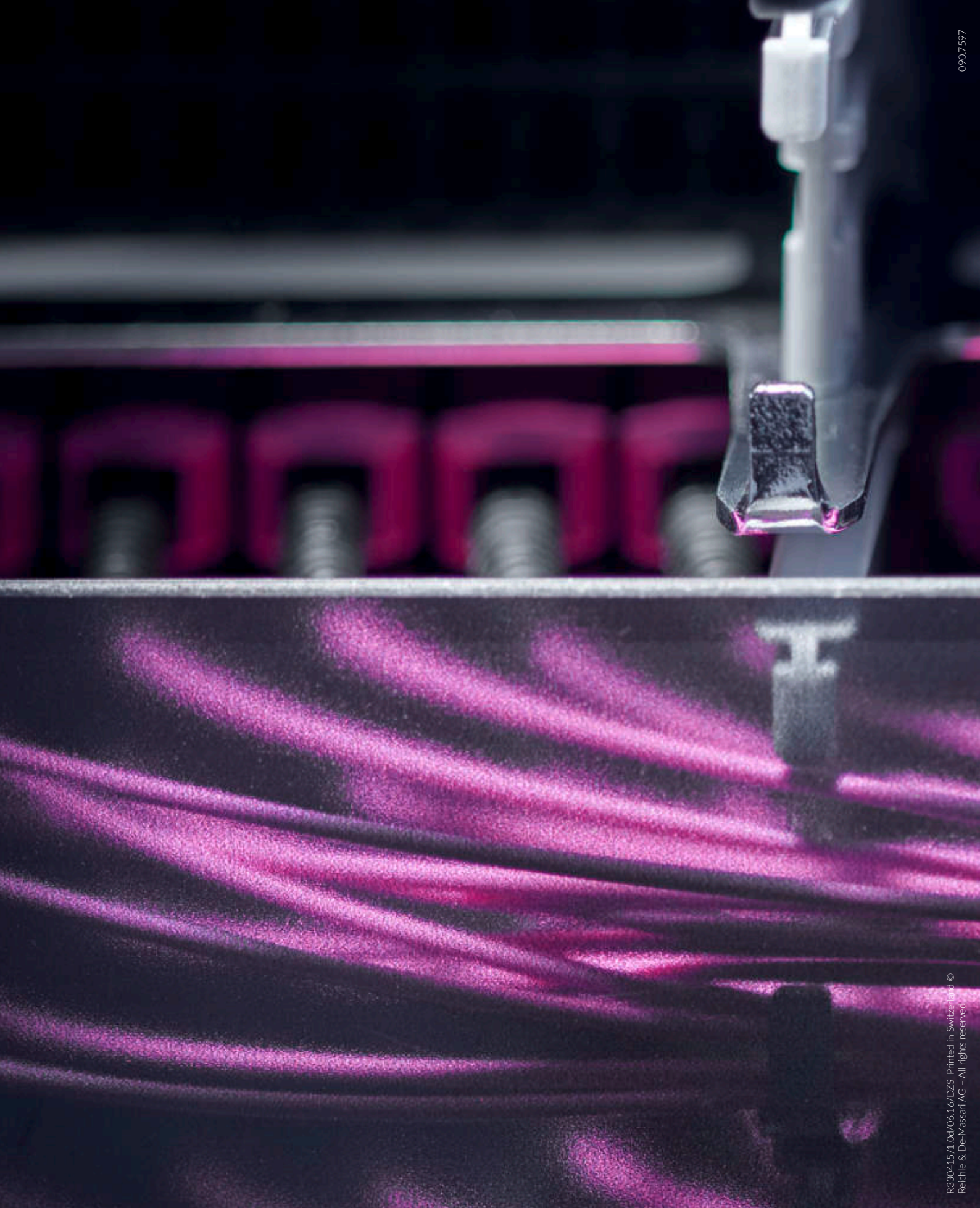
As a global Swiss developer and provider of connectivity systems for high quality, high performance data center networks, R&M offers trusted advice and tailor-made solutions that help Infrastructure and Operation Managers delivering agile, reliable and cost-effective services for a business-oriented IT infrastructure.

Knowing that highest quality products alone are not enough to guarantee faultless operation, R&M works with you on a thorough analysis followed by a structured and forward-looking design of the physical network to provide efficient solutions.

If you are looking for trusted advice and enduring post-sales service – R&M can help.

For additional information, please visit rdm.com

***“Delivering the highest
10/40/100GbE
density of any fiber
solution out there.”***

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