Solutions@KERPEN
IT Cabling Systems

The Quality Connection

LEONI

At a glance

2008/2009 Edition
All the necessary planning documents are available in the Internet: www.leoni-datacom.com
Subject to printing errors, mistakes and technical changes

Who are we?

For more than 85 years now, LEONI Kerpen as one of the leading companies in the cable industry has been successfully meeting the complex demands of international markets. The company now employs more than 700 people. A central element of the LEONI Kerpen philosophy is the quest for constant improvement – feet firmly planted in the past and head in the world of the future! And it is to the future that we look, producing high-quality, innovative cable and cabling products which are always one step ahead of the standards of the time.

As competent developers and manufacturers of cables and cabling systems, we now meet high-end requirements in information technology and industrial markets. Ethernet and Internet Protocol (IP) are the common denominator connecting LAN Office, LAN Industry, city networks/telecom and LAN Home. These fields are all coming together and changing the communication scene.

LEONI Kerpen´s Business Unit "Datacom" has the necessary passive system solutions in the form of copper data cables and fiber optic cables. MegaLineNet® consisting of MegaLine® copper data cables and the necessary systems engineering allows high-performance systems for structured in-house cabling to be built up. Wherever broadband data transmission and long transmission distances in LANs and city networks are required, GigaLineNet® is the system choice of today – with FO system engineering and GigaLine® fiber optic cables in improved Gigabit and Ethernet quality.

For the purposes of industry and the international project business in plant engineering, the Business Unit "Industrial Projects" provides high-quality cables for measurement and control engineering which comply fully with national and international standards. We can also provide cables to factory specifications and custom-made according to the specific wishes of our customers.

The development and production of compounds for the cable and plastics industry rounds off our varied product portfolio.

LEONI Kerpen with its committed, creative and competent employees is at home in the markets of the world, by way of branches and sales offices or via representatives. Quality is, and always will be, the LEONI Kerpen yardstick.

This is documented by the quality management system (DIN EN ISO 9001) which was certified for the first time in 1990. Since 1998, LEONI Kerpen has also been certified according to the environmental management system DIN ISO 14001.

MegaLineNet® and GigaLineNet®

Applications and market segments

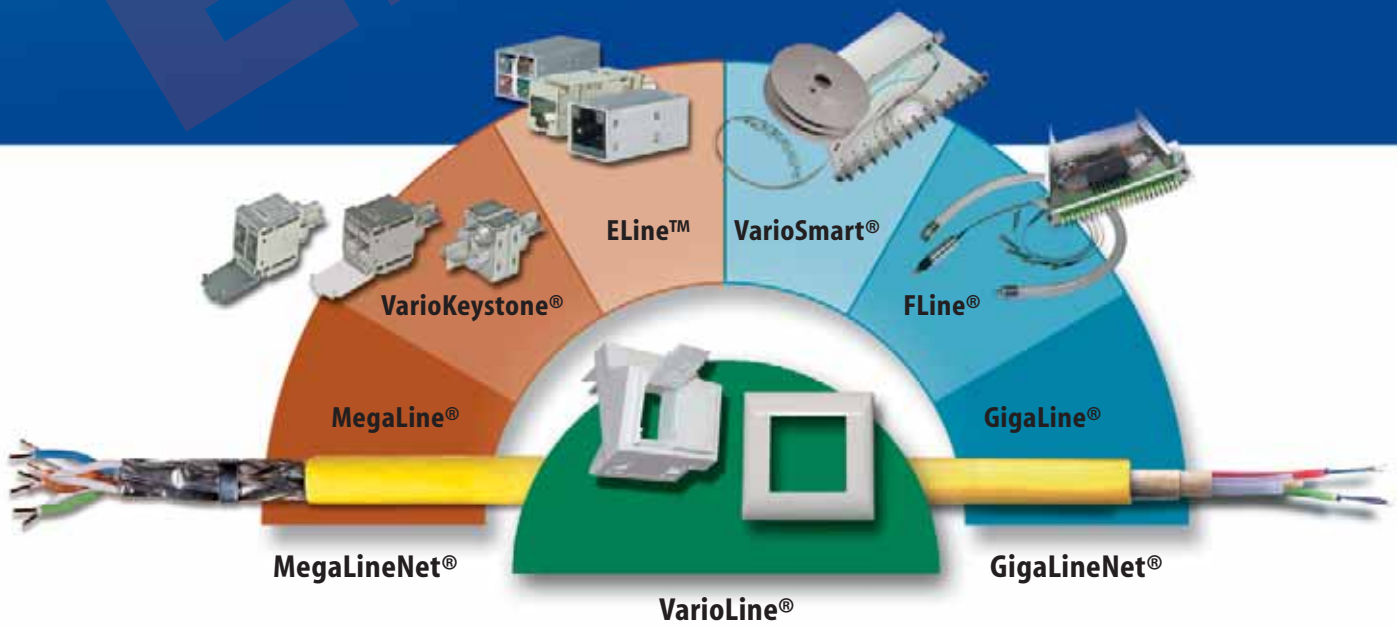
LEONI Kerpen develops and produces high-quality products for passive cabling infrastructure in buildings and local networks.

MegaLineNet® cables and systems engineering or GigaLineNet® FO cables and systems engineering.

In the applications LAN Office, LAN Industry, SAN/Data Center and LAN Home, LEONI Kerpen with its Business Unit "Datacom" offers standard systems as well as customer-specific solutions.

MegaLineNet® from LEONI Kerpen is a copper system family for all classes and categories with a secure future and a high degree of investment protection. MegaLineNet® consists of the cable engineering of MegaLine® patch and data cables and the system solutions ELine™ and VarioKeystone®.

With its FO engineering, GigaLineNet® allows extremely high bandwidths and long transmission distances. Here GigaLine® fiber optic cables in conjunction with VarioSmart® or FLine® systems engineering make an extremely high-performance system possible.



LAN Office

The scalability of Ethernet technology allows the constant expansion of the networks used for information engineering in buildings. In banks and insurance companies, research and development, universities, hospitals, hotels, airports and many other fields of application, high-performance, highly available Ethernet networks are indispensable for smooth operation and economic success. Besides the economically sound networking of PCs and printers, the intelligent combination of fibre optic technology in the backbone and copper technology up to the user allows IP telephony too. In addition, Power over Ethernet supplies terminal equipment such as WEB cameras, WLAN access points, IP telephones and notebooks with electricity and voltage – all via the structured copper cabling!

MegaLineNet® and GigaLineNet® from LEONI Kerpen make up a comprehensive range of copper and FO solutions according to ISO/IEC 11801 / EN 50173-1/2. In addition, advice is offered with regard to TR ISO/IEC 24750 and EN 50173-99-1 and as a guide to selecting products.

LAN Industry

LAN Industry has become successfully established as a communication medium in industrial automation. The technology is now used on all levels for the networking of controls, drives, PCs and remote I/Os. Ethernet offers the advantage of a sophisticated, standardised technology as well as great potential for rationalisation:

- The worldwide IT standard
- Consistent communication to office computer technology
- Standardised protocols for data communication and web functions
- Scalable
- Transparent communication between all network participants
- Simplified programming, taking into operation and servicing

MegaLineNet® and GigaLineNet® comply with ISO/IEC 24702/EN 50173-3. We will be glad to advise you on the subject of the MICE concept.

SAN/DATA Center

Large companies often have extensive memory networks and computer centres. The high demands can be met using cabling solutions with between 10 and 100 Gbits/s. Besides the price and what you get for it, system stability (for example via a redundant network design), high flexibility and consistent serviceability of the company network also play a particularly important part.

With MegaLineNet® and GigaLineNet®, LEONI Kerpen provides a comprehensive range of copper and fiber optic solutions for SAN/DATA centres according to ISO/IEC 24764 and EN 50173-5 too. We will gladly help you to choose the products you require.

LAN Home

Whereas the LAN Office field focuses on the networking of printers and PCs, multimedia applications are the centre of interest in the LAN Home segment.
Service-independent broadband multimedia cablings provide the platform for combining information and communication engineering at the home workplace with the range of entertainment offered in the leisure field.
There are now an increasing number of components with network capabilities which can turn your PC into a television set, your television set into an Internet access point with a playstation and your stereo system into a storage medium for MP3 files.

Kerpen HomeNet® conforms to the ISO/IEC 15018 and EN 50173-4 standards for detached and semi-detached houses.
Please don't hesitate to ask us about the network design.

Copper cables and systems

MegaLineNet®

MegaLine® data cables

MegaLine® patch cords

ELine™ connecting components

VarioLine® wall outlet program

VarioKeystone® connecting components

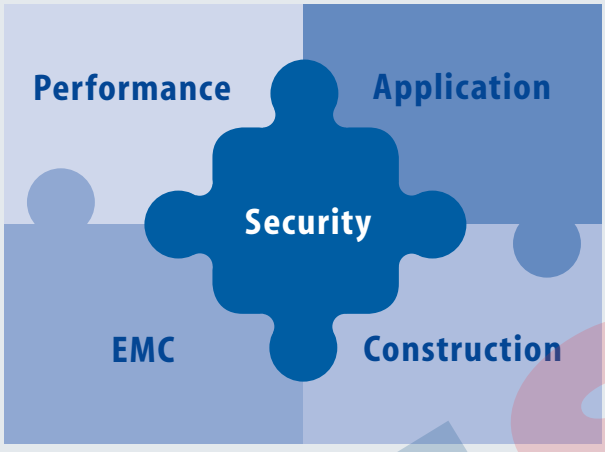
With MegaLineNet®, LEONI Kerpen offers you data cables, patch cords and connecting components of all classes and categories for building up high-quality channels using copper cables. MegaLine® copper data cables and ELine™ / VarioKeystone® connection technology as well as the new VarioLine® outlet program combine to form a comprehensive and well-matched complete system.

MegaLineNet® – the cables

The new MegaLine® SPACE range from LEONI Kerpen has set new standards for evaluating and classifying copper data cables.

The SPACE concept

With the SPACE concept, LEONI Kerpen offers the market and its customers a decision-making matrix for finding the correct data cable in a pragmatic and structured way.
The SPACE concept is based on the classification of the 5 main selection criteria for determining the potential overall performance of a data cable.



It also allows the value for money to be assessed and makes room for alternative technical and economic scenarios.

The demands made on the segment in question rise in step with the increase in the SPACE index. For example, the cable marked in the SPACE matrix is a data cable with the SPACE code 34455. This means that the data cable in question passes the fire test according to IEC 60332-3-24 (Security Level 3), meets the minimum requirements of the new Class F_A (Performance Level 4) and is dimensioned for applications with more than 10 GbE (Application Level 4). It consists of a conductor with AWG 22 (Construction Level 5) and thus has low attenuation values and an increased current-handling capacity. The coupling losses are > 80 dB (EMC Level 5).

After SPACE classification, the appropriately structured MegaLine® specifications allow the elaboration of further unique technical features such as the safety reserves of the electrical characteristics in comparison to the minimum requirements of the standard and the freedom from heavy metals according to RoHS.

With the VDE kitemark (an independent hallmark of quality including production monitoring), LEONI Kerpen documents that it guarantees the SPACE quality features at all times.

SPACE Matrix

	S Security (Fire behaviour)	P Performance (Cabling class, bandwidth)	A Application (Ethernet, TV)	C Construction (Conductor dimensions, tensile strength)	E EMC (Coupling losses)
1	IEC 60332-2-2	> Class E > 250 MHz	> 100 MbE	AWG 27	> 40 dB
2	IEC-60332-1-2	> Class E_A > 500 MHz	> 1 GbE	AWG 26/25	> 50 dB
3	IEC-60332-3-24	> Class F > 600 MHz	Up to 10 GbE	AWG 24	> 60 dB
4	EFP Grade 1	> Class F_A > 1,000 MHz	> 10 GbE	AWG 23	> 70 dB
5	EFP Grade 2	> Class „G“ > 1,200 MHz	> 10 GbE TV	AWG 22	> 80 dB

S:SECURITY

Fire behaviour

As a result of the constant increase in the installed basis and the installation density, the fire behaviour of data cables is an important safety criterion for avoiding fire damage to persons and material assets. In themselves, data cables are safe resources.
When manufactured according to the legal regulations and installed correctly, they cannot cause a fire. Like all objects made of plastic, however, if cables catch fire, they can ignite and spread the fire.
One of the aims here is to prevent the propagation of fire and the resulting damage by using flame-retardant, halogen-free cable designs.

MegaLine® data cables have improved fire protection characteristics:

- The extremely low smoke development according to IEC 61034 makes rescue and salvage operations easier
- The low toxicity (dioxins are not produced) means that the risk of poisoning is reduced
- As a result of the freedom from halogens according to IEC 60754-2, there is no consequential damage to material assets as a result of corrosion
- The low fire load values limit the exacerbating effects on the source of the fire
- The high oxygen index (0l up to 45) reduces the flammability

The SPACE concept offers five different security levels with regard to the fire propagation / flame retardance:

S_1: IEC 60332-2-2:
Testing of the vertical flame propagation in a core or individual cable. Test method: incandescent flame.

S_2: IEC 60332-1-2:

Testing of the vertical flame propagation in a core or individual cable. Test procedure: 1 KW flame. A flame is applied to the lower end of a vertical sample of the cable with a length of approx. 60 cm for about 60 seconds using a type of Bunsen burner. After removal of the burner, the flames must go out by themselves. The parts of the cable damaged by the flames must not reach its upper end (distance: 50 mm).

S_3: IEC 60332-3-24:
Testing of the flame propagation in an arrangement of several cables, a so-called cable bundle, is carried out according to IEC 60332-3-24. In this cable bundle test, a flame is applied to the lower part of the test samples on a vertical ladder with a length of 360 cm using a high-performance burner. During and after intensive application of the flame for a test period of 20 minutes, the cables must not burn higher than 250 cm.

S_4: EFP (Enhanced Fire Performance) Grade 1

In this cable bundle test, a flame is applied to the lower part of the test samples on a vertical ladder with a length of 360 cm using a high-performance burner. During and after intensive application of the flame for a test period of 20 minutes, only about 1 m of the section to which the flame is applied must burn. Immediately after removal of the flame, the self-extinguishing process must start. Only specially designed data cables can stand up to this exacting fire test.

S_5: EFP (Enhanced Fire Performance) Grade 2
This stricter safety level is application-specific.

Safety levels S_3 to S_5 are used in particular where high and very high safety measures are required for the protection of persons (in hospitals, schools, hotels, airports, stations, department stores etc.) or material assets (in power stations, computer centres, banks and insurance companies, alarm systems etc.).

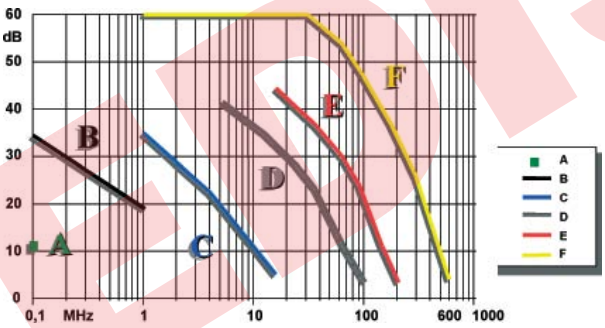
P:PERFORMANCE

Cabling class/bandwidth

Indoor cablings are expected to have a service life of 10 to 15 years. This requires far-sighted planning of the necessary performance of cabling systems and their components.
The international standards have often not gone far enough due to the compromises struggled for and in view of the swiftly increasing transmission rates. Since the development of 10 Gigabit Ethernet, none of the cabling classes below Class F can be said to meet the demands of the future.

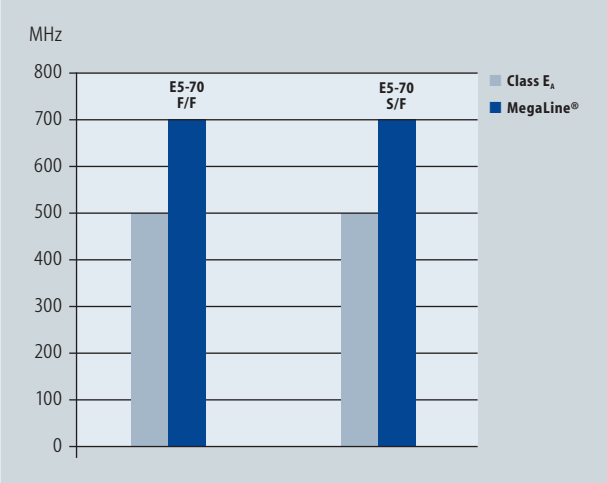
P_1: better than Class F (250 MHz)

For example MegaLine® E2-45 U/F:
better than Category 6 according to EN 50288 and IEC 61156
very good NEXT, low SKEW



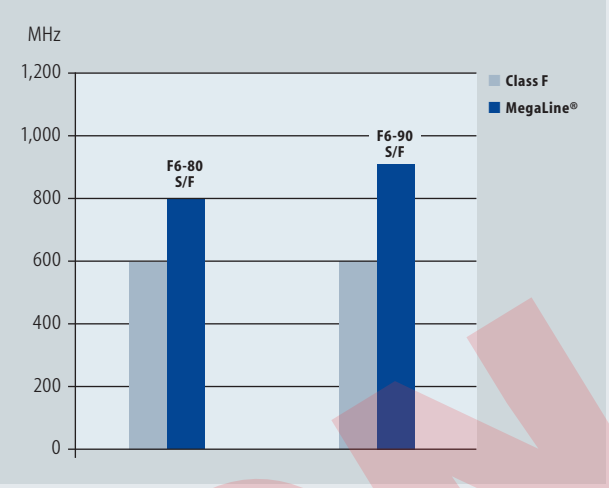
With the MegaLine® SPACE concept, LEONI Kerpen provides five different performance classes to choose from. Each of them in itself has very high reserves with regard to the standard involved.

P_2: better than Class E_A (500 MHz)



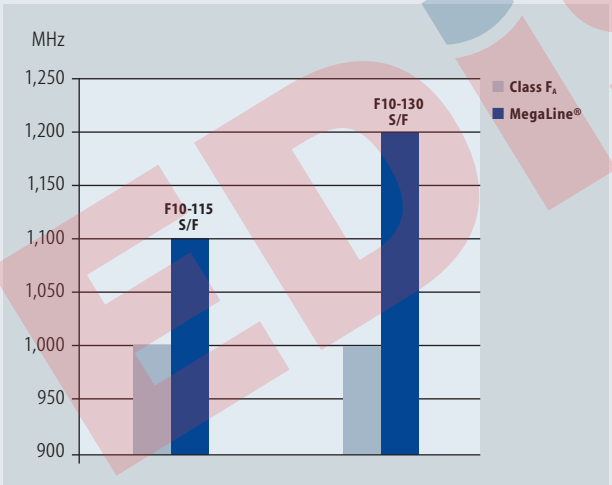
For example MegaLine® E5-70 S/F:
better than Category 6 according to EN 50288 and IEC 61156
very good NEXT, very good shield characteristics (shielding of pairs and overall shielding), low SKEW

P_3: better than Class F (600 MHz)



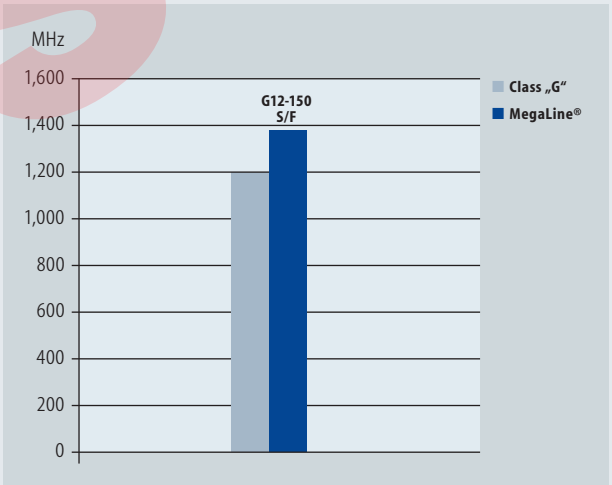
For example MegaLine® F6-90 S/F:
better than Category 7 according to EN 50288 and IEC 61156
excellent NEXT, excellent shield characteristics (shielding of pairs and overall shielding), low SKEW

P_4: better than Class F_A (1,000 MHz)



For example MegaLine® F10-130 S/F:
better than Category 7 according to EN 50288 and IEC 61156
excellent NEXT, low attenuation, excellent shield characteristics (shielding of pairs and overall shielding), low SKEW

P_5: better than Class "G" (1,200 MHz)



MegaLine® G12-150 S/F is better than Category 7 ("8") according to EN 50288 and IEC 61156
excellent NEXT, excellent shield characteristics
(shielding of pairs and overall shielding), low SKEW

MegaLine® data cables have excellent transmission performance. They offer high safety reserves and are always one step ahead of the standard.
MegaLine®: an investment with a future!

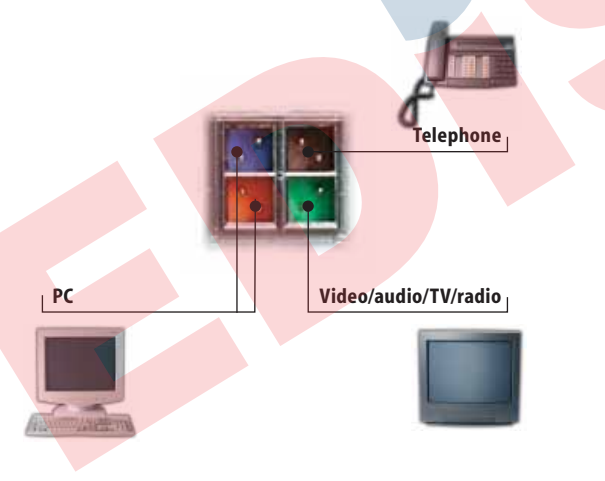
A:APPLICATION

Ethernet/TV

MegaLine® data cables are real all-rounders
The excellent capacity, the "total" universality and the convincing cost effectiveness of MegaLine® data cables make them an unbeatable transmission medium over the last mile.
No other transmission medium has as many advantages when the aim is to network communication and information facilities in an economical way which meets the demands of the future.

The large safety reserves mean that multimedia applications like TV or transmission protocols with high bandwidth requirements such as 10 Gigabit Ethernet and 8 Gigabit Fiberchannel can be transmitted over 100 m.

Experts have calculated that, as far as we know today, **MegaLine® Category 7 data cables allow transmission distances of as much as 56 Gbit/s.**



The use of low-loss broadband S/FTP cables with individual or overall shield in conjunction with multimedia cabling systems such as ELine 1200® EC7 allows so-called cable or duty sharing.

Cables and connectors form a perfect symbiosis: 4 pairs, 4 connecting clips: each with GHz performance.

This allows the parallel, simultaneous use of different applications via one cable and one connector: data, voice and images.

Ultimately, this multimedia system does not need to cost more than conventional systems, in which an individual cable and an individual connector is usually required for each service.

This allows savings of up to 50 % of the necessary cables, connectors, outlets and patch panels.

Multiple use reduces the system costs by 15 – 30 % (depending on the services used). The reduction of the cables and outlets actually required usually also allows reductions in the costs for cable channels, switching cabinets etc.

But MegaLine® data cables are capable of more
The supply of current (up to 350 mA) and voltage (up to 48 V) can be provided via **PoE (according to IEEE 802.3af).**
The current is fed in centrally via the floor distributor or switch.
Devices such as IP telephones, Web cameras, WLAN access points etc. are supplied via the telecommunications outlet.
The voltage is tapped via a phantom circuit or two unassigned pairs.

LEONI Kerpen provides five different application levels with the MegaLine® SPACE concept.

A_1: > 100 Mbit/s (Fast Ethernet)
IEEE 802.3 u
A_2: > 1,000 Mbit/s (Gigabit Ethernet)
IEEE 802.3 ab
A_3: ≤ 10,000 Mbit/s (10 Gigabit Ethernet)
IEEE 802.3 an
A_4: > 10,000 Mbit/s (10 Gigabit Ethernet)
IEEE 802.3 an
A_5: > 10,000 Mbit/s (10 Gigabit Ethernet) und TV
IEEE 802.3 an and multimedia

MegaLine® data cables have a convincingly wide range of applications and are unbeatable value for money.

C:CONSTRUCTION

Conductor dimensions

The demands made on data cables designed to meet the demands of the future are varied and at times contradictory. MegaLine® data cables of all categories and classes combine high-performance, universal capabilities and economic efficiency. This standard of quality can only be achieved via an integrated cable design.

LEONI Kerpen first put MegaLine® data cables in 4-pair S/FTP design (100 Ohm) on the market in the early 90s. This LEONI Kerpen innovation has been constantly optimised and adapted to the requirements of the market ever since.
High-precision conductor and core geometries, optimally matched lay lengths in the pairs and the use of very high-quality insulation and sheath materials are the characteristic features of MegaLine® data cables.

MegaLine® data cables are produced on ultra-modern equipment. As a result of procedural innovations, the machinery used corresponds with the "state of the art" in the data cable industry. The use of physical foaming in the manufacture of high-frequency cores allows excellent, uniform electrical and geometrical characteristics to be achieved. Double skin layers ensure excellent mechanical stability. Patented stranding techniques show that, from a technical point of view, LEONI Kerpen takes the lead in the data cable industry.

MegaLine® data cables have low external diameters, thus allowing high packing densities and small bending radii.
The weight reductions and the robust cable structure offer advantages for assembly and installation, even under difficult conditions.

With the SPACE concept, LEONI Kerpen divides the MegaLine® range up into five different performance classes. The conductor classes describe the permitted tensile stress during installation and the conductor resistance. The current-handling capacity for a maximum environmental temperature of 60°C and the maximum installation lengths in the transmission channel can be derived from this on request.

C_1: AWG 27 (7x0.14 mm/0.112 mm²)
Tensile stress: 40/20 N (4P/2P) maximum
Conductor resistance: 165 ohm/km maximum

C_2: AWG 26 / AWG 25

- **C_{21}: AWG 26 (7x0.16 mm/0.14 mm²)**
  Tensile stress: 60/30 N (4P/2P) maximum
  Conductor resistance: 132 ohm/km maximum
- **C_{22}: AWG 25 (7x0.18 mm/0.175 mm²)**
  Tensile stress: 70/35 N (4P/2P) maximum
  Conductor resistance: 105.6 ohm/km maximum

C_3: AWG 24 (0.51 mm/0.205 mm²)
Tensile stress: 90/45 N (4P/2P) maximum
Conductor resistance: 86.8 ohm/km maximum

C_4: AWG 23 (0.57 mm/0.258 mm²)
Tensile stress: 110/55 N (4P/2P) maximum
Conductor resistance: 68.9 ohm/km maximum

C_5: AWG 22 (0.64 mm/0.325 mm²)
Tensile stress: 130/65 N (4P/2P) maximum
Conductor resistance: 54.7 ohm/km maximum

MegaLine® data cables can be recognized by their unmistakable "Ethernet" yellow. But there's only LEONI inside if it says so on the outside!

E:EMC

Coupling attenuation

The electromagnetic compatibility (EMC) is the ability of devices, systems and plants to function satisfactorily in an electromagnetic environment without negative effects on other devices, systems or plants.
EMC legislation prescribes the electromagnetic compatibility of devices, systems and plants. The limits for the emission of interference and the immunity to interference which must be observed are regulated in EN 55022 (Class B) and EN 50082-1/2 / EN 55024.

The purpose of a data cable is to resist electromagnetic influences coming from the outside to the inside (immunity to interference) and from the inside to the outside (emission of interference).
The susceptibility of data cable systems to interference increases in step with the transmission frequency and the data rates (currently 10 Gigabit Ethernet).
The main danger is increasingly a result of the Alien Crosstalk between adjacent data cables.

Depending on their structure, data cables have different capabilities with regard to the prevention or reduction of interference.

- Unshielded data cables have very good symmetry characteristics but are not shielded against internal, external or adjacent sources of interference. They are endangered to a high degree by the environment of the installation.
- Data cables with individual or overall shield have very good symmetry characteristics and good or even very good shield characteristics. The EMC is very good or even excellent. Interference coming from the environment of the installation (adjacent data cables) can be ruled out completely.

With the MegaLine® SPACE concept, LEONI Kerpen provides five different EMC levels to choose from.

The evaluation criteria are the coupling attenuation (interference power suppression).
As the sum of the shield attenuation and the symmetry attenuation, the coupling attenuation are the "be-all and end-all" for the assessment and comparison of the overall EMC behaviour of data cables with various different structures.
MegaLine® data cables with a dual shield reach values of > 80 dB up to 1,000 MHz, thus suppressing incoming or outgoing potential interference by a factor of > 10,000.

E_1: Coupling attenuation > 40 dB
Interference suppression exceeding a factor of 100

E_2: Coupling attenuation > 50 dB
Interference suppression exceeding a factor of 300

E_3: Coupling attenuation > 60 dB
Interference suppression exceeding a factor of 1,000

E_4: Coupling attenuation > 70 dB
Interference suppression exceeding a factor of 3,000

E_5: Coupling attenuation > 80 dB
Interference suppression exceeding a factor of 10,000

MegaLine® S/FTP data cables with overall shield and individually shielded S/FTP data cables have an excellent EMC, making them an obvious choice for the fail-safe transmission of high data rates such as those offered by 10 Gigabit Ethernet etc.

Electromagnetic compatibility

Structure	U/UTP	F/UTP	S/FTP
Symmetry characteristics	+++	++	++
Shield characteristics	./.	+	+++
Influence of the installation environment	–	–	./.

Nomenclature

There are a large number of different type designations. The standardisation defined in ISO/IEC 11801 2nd Edition determines the elements of the design in an unambiguous way:

x x / x x x

- Balanced element ___ TP
- Individual shield ___ U = Unshielded
  F = Foil shield
- Overall shield ___ F = Foil shield
  S = Copper braid shield
  SF = Copper braid and foil shield

Examples:

SF/UTP = Cable with overall copper braid and foil shield with unshielded individual elements.

S/FTP = Cable with overall copper braid shield and individual elements with foil shield.

Cable types

S/FTP

F/FTP

U/FTP

Letter for cabling class	Bandwidth acc. to standard (factor 100)	Bandwidth MegaLine® (factor 10)
„G" = Class „G" F = Class F E = Class E D = Class D	12 = 1,200 MHz 10 = 1,000 MHz 6 = 600 MHz 5 = 500 MHz 2 = 250 MHz 1 = 100 MHz	150 = 1,500 MHz 130 = 1,300 MHz 115 = 1,150 MHz 90 = 900 MHz 80 = 800 MHz 70 = 700 MHz 45 = 450 MHz 30 = 300 MHz 20 = 200 MHz

SF/UTP

F/UTP

U/UTP

With the SPACE concept, LEONI Kerpen has introduced a new nomenclature for MegaLine®. This makes it easier to assign cables to the old and new cabling classes and the corresponding categories. The new nomenclature also includes the indication of the bandwidth of MegaLine® in comparison to the standard. This allows you to make the perfect choice "at a glance".
The new nomenclature is rounded off by information on design according to the international standard and the material used for the sheath.

Example:

MegaLine® F10-130 S/F H: data cable according to new cabling class FA (1,000 MHz) with a bandwidth of 1,300 MHz in S/FTP design and with a halogen-free outer sheath.

Design
TP (Twisted Pair)

S/F = Overall shield (copper braid)/individual shield (foil)
F/F = Overall shield (foil)/individual shield (foil)
U/F = Unshielded/individual shield (foil)
SF/U = Overall shield (copper braid & foil)/unshielded
F/U = Overall shield (foil)/unshielded
U/U = Unshielded/unshielded

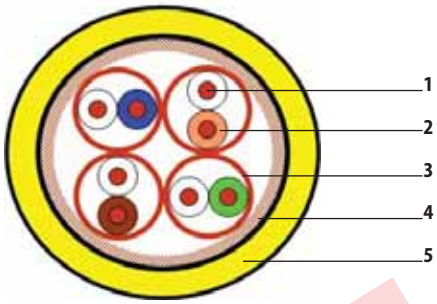
Sheath

H = Halogen-free, flame-retardant
Y = PVC
2Y = PE
11Y = PUR

MegaLine® G12-150 S/F

$S_3 P_5 A_5 C_5 E_5$ Type: KS-02YSCH 4x2xAWG 22/1 PIMF

Category: "8"



Office

Printing outer sheath:
LEONI MegaLine G12-150 S/F 4P H
SPACE Code 35555
"VDE approval mark" "Production lot code"
"Meter marking"

Colour code: wh/bu, wh/or, wh/gn, wh/bn
Colour outer sheath: yellow, RAL 1021

Construction:

1	Conductor:	bare copper wire, AWG 22/1
2	Insulation:	cellular-PE, core-Ø: nominal value 1.6 mm
	Twisting element:	Pair
3	Individual screen:	aluminium-bonded polyester tape
	Twisting:	4 pairs
4	Overall screen:	tinned copper wire braid
5	Outer sheath:	halogen-free, flame retardant compound

Fire behaviour:
Flame retardance: acc. to IEC 60332-3-24
Halogen acid gas emission: acc. to IEC 60754-2
Smoke density: acc. to IEC 61034
Calorific value (MJ/m): 0.74 (approx.)

	1	2	3	4	5
S	IEC 60332-2-2	IEC-60332-1-2	IEC-60332-3-24	EFP Grade 1	EFP Grade 2

Security (Fire behaviour)

Performance:
better than category 7 ("8") acc. EN 50288 and IEC 61156
excellent NEXT, very low attenuation, excellent screening characteristics (individual and overall screen),
low SKEW
Bandwidth 1,500 MHz

	1	2	3	4	5
P	> Class E > 250 MHz	> Class E_A > 500 MHz	> Class F > 600 MHz	> Class F_A > 1,000 MHz	> Class „G" > 1,200 MHz

Performance (Cabling class, bandwidth)

Applications:
Installation cable for generic cabling systems acc. ISO/IEC 11801 and EN 50173 (2. edition) and for residential cabling and SOHO acc. ISO/IEC 15018 and EN 50173-4 (draft).
Ideal for all applications of classes D up to F_A Multimedia (TV, Video, Data, Voice) >10 GbE acc. IEEE 802.3 an,
Cable sharing, VoIP, PoE

	1	2	3	4	5
A	> 100 MbE	> 1 GbE	bis 10 GbE	> 10 GbE	> 10 GbE TV

Application (Ethernet, TV)

Mechanical characteristics:
Bending radius:
during installation: 8 x overall diameter (min.)
after installation: 4 x overall diameter (min.)
Tensile strength: 130 (max.)
Crush (N/100 mm): 1,000
Impact (number of shocks): 10

	1	2	3	4	5
C	AWG 27	AWG 26/25	AWG 24	AWG 23	AWG 22

Construction (Conductor size, Tensile strength)

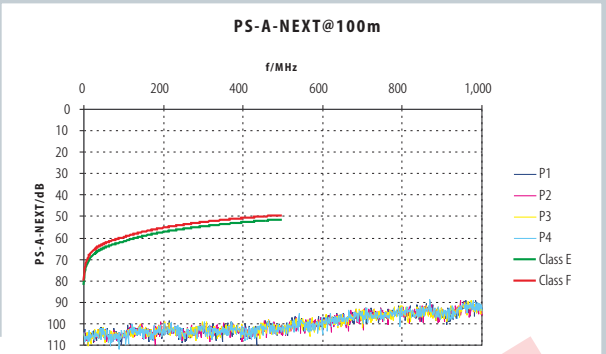
Electromagnetic behaviour:
Transfer impedance at 10 MHz (mOhm/m): 2 (nominal value)
Screening attenuation up to 1,000 MHz (dB): 80 (nominal value)
Coupling attenuation up to 1,000 MHz (dB): 90 (nominal value)

	1	2	3	4	5
E	> 40 dB	> 50 dB	> 60 dB	> 70 dB	> 80 dB

EMC (Coupling attenuation)

Electrical characteristics at 20°C:

DC resistance (Ohm/km):	57.1 (max.)
Insulation resistance (Gohm x km):	5 (min.)
Mutual capacitance (pF/m):	42 (approx.)
Transfer capacitance (e) (pF/km):	1,500 (approx.)
Signal velocity (c):	0.80 (approx.)
Propagation delay (ns/100m):	420 (approx.)
Skew at 100 MHz (ns/100m):	3 (approx.)
Characteristic impedance at 100 MHz (Ohm):	100 ± 5
Test voltage Ueff (V):	1,000
Operating voltage Ueff (V):	125 (max.)



Frequency MHz	Attenuation dB/100m		NEXT dB		PS-NEXT dB		ACR dB@100m		PS-ACR dB@100m		EL-FEXT dB@100m		PS-ELFEXT dB@100m		RL dB	
	typ.	Cat. 7 max.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*
1	1.6	2	110	80	107	77	108	78	105	75	109	80	106	77	26.1	23
10	4.2	5.7	110	80	107	77	106	74	103	71	109	74	106	71	32.3	25
100	14.4	18.5	110	72	107	69	96	54	93	51	93	54	90	51	36.2	20.1
200	21.5	26.8	110	68	107	65	88	41	85	38	86	48	83	45	35.5	18
250	24.5	30.2	105	66	102	63	81	36	78	33	83	46	80	43	34.8	17.3
500	34	44.1	105	62	102	59	71	18	68	15	70	40	67	37	31.8	17.3
600	37.7	48.9	100	61	97	58	62	12	59	9	64	38	61	35	28.5	17.3
800	44.5	–	95	–	92	–	50	–	47	–	58	–	55	–	25.3	–
900	48.1	–	95	–	92	–	47	–	44	–	54	–	51	–	23.8	–
1,000	49	–	92	–	89	–	43	–	40	–	49	–	46	–	22.2	–
1,200	54.9	–	88	–	85	–	34	–	31	–	40	–	37	–	20.2	–
1,300	57	–	81	–	78	–	24	–	21	–	35	–	32	–	18.3	–
1,400	58.1	–	74	–	71	–	16	–	13	–	30	–	27	–	16.3	–
1,500	62	–	73	–	70	–	11	–	8	–	25	–	22	–	12.3	–

* EN 50288-4-1(2004)/IEC 61156-5(2002)

Chemical characteristics:
Free of hazardous substances acc. to RoHS 2002/95/EG

Certificates and Approvals:
Quality mark with production control: VDE
Link-Performance: MegaLineNet® systems and further commercial cabling systems
Inspection certificate: acc. to DIN 55350-18-4.2.1 respectively EN 10204
In agreement to LVD (73/23/EEC): CE

Thermal characteristics:
Temperature range for fixed installation
-20°C up to +60°C
Temperature range for mobile operation
0°C up to +50°C

Article Number	Size	Overall diameter mm	Weight kg/km	Copper content kg/km	Colour sheath
7KS80001	4P	8.6 (approx.)	80 (approx.)	48	yellow, RAL 1021

Package: Drum 1,000 m

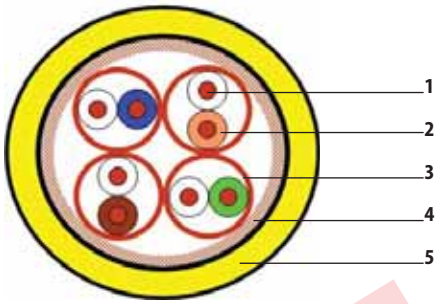
MegaLine® F10-130 S/F

$S_3 P_4 A_4 C_5 E_5$

Category: "7_A"

Type: KS-02YSCH 4x2xAWG 22/1 PIMF

Type: KS-02YSCH 2x(4x2xAWG 22/1 PIMF)



Office

Printing outer sheath:
LEONI MegaLine F10-130 S/F 4P H
SPACE Code 34455
"VDE approval mark" "Production lot code"
"Meter marking"

Colour code: wh/bu, wh/or, wh/gn, wh/bn
Colour outer sheath: yellow, RAL 1021

Construction:

1	Conductor:	bare copper wire, AWG 22/1
2	Insulation:	cellular-PE, core-Ø: nominal value 1.6 mm
	Twisting element:	Pair
3	Individual screen:	aluminium-bonded polyester tape
	Twisting:	4 pairs
4	Overall screen:	tinned copper wire braid
5	Outer sheath:	halogen-free, flame retardant compound

Fire behaviour:
Flame retardance: acc. to IEC 60332-3-24
Halogen acid gas emission: acc. to IEC 60754-2
Smoke density: acc. to IEC 61034
Calorific value (MJ/m): 0.7 (Sx) / 1.4 (Dx) (approx.)

	1	2	3	4	5
S	IEC 60332-2-2	IEC-60332-1-2	IEC-60332-3-24	EFP Grade 1	EFP Grade 2

Security (Fire behaviour)

Performance:
better than category 7 acc. EN 50288 and IEC 61156
excellent NEXT, low attenuation, excellent screening characteristics (individual and overall screen),
low SKEW
Bandwidth 1,300 MHz

	1	2	3	4	5
P	> Class E > 250 MHz	> Class E_A > 500 MHz	> Class F > 600 MHz	> Class F_A > 1,000 MHz	> Class „G" > 1,200 MHz

Performance (Cabling class, bandwidth)

Applications:
Installation cable for generic cabling systems acc. ISO/IEC 11801 and EN 50173 (2. edition).
Ideal for all applications of classes D up to F_A Multimedia (Video, Data, Voice) >10 GbE acc. IEEE 802.3 an,
Cable sharing, VoIP, PoE

	1	2	3	4	5
A	> 100 MbE	> 1 GbE	bis 10 GbE	> 10 GbE	> 10 GbE TV

Application (Ethernet, TV)

Mechanical characteristics:
Bending radius:
during installation: 8 x overall diameter (min.)
after installation: 4 x overall diameter (min.)
Tensile strength: 130 (max.)
Crush (N/100 mm): 1,000
Impact (number of shocks): 10

	1	2	3	4	5
C	AWG 27	AWG 26/25	AWG 24	AWG 23	AWG 22

Construction (Conductor size, Tensile strength)

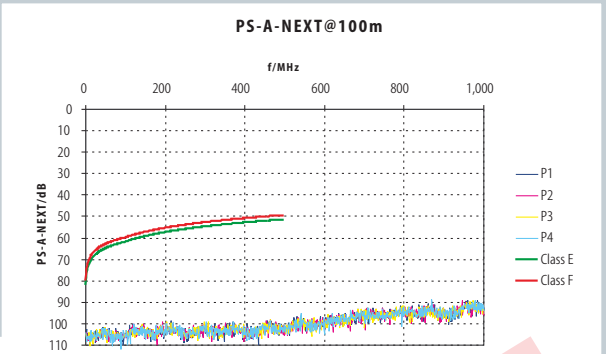
Electromagnetic behaviour:
Transfer impedance at 10 MHz (mOhm/m): 5 (nominal value)
Screening attenuation up to 1,000 MHz (dB): 70 (nominal value)
Coupling attenuation up to 1,000 MHz (dB): 85 (nominal value)

	1	2	3	4	5
E	> 40 dB	> 50 dB	> 60 dB	> 70 dB	> 80 dB

EMC (Coupling attenuation)

Electrical characteristics at 20°C:

DC resistance (Ohm/km):	57.1 (max.)
Insulation resistance (Gohm x km):	5 (min.)
Mutual capacitance (pF/m):	40 (approx.)
Transfer capacitance (e) (pF/km):	1,500 (approx.)
Signal velocity (c):	0.80 (approx.)
Propagation delay (ns/100m):	420 (approx.)
Skew at 100 MHz (ns/100m):	5 (approx.)
Characteristic impedance at 100 MHz (Ohm):	100 ± 5
Test voltage Ueff (V):	1,000
Operating voltage Ueff (V):	125 (max.)



Frequency MHz	Attenuation dB/100m		NEXT dB		PS-NEXT dB		ACR dB@100m		PS-ACR dB@100m		EL-FEXT dB@100m		PS-ELFEXT dB@100m		RL dB	
	typ.	Cat. 7 max.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*
1	1.7	2	105	80	102	77	104	78	101	75	105	80	102	77	27.1	23
10	4.5	5.7	105	80	102	77	101	74	98	71	108	74	105	71	35.2	25
100	15.4	18.5	105	72	102	69	90	54	87	51	93	54	90	51	38.9	20.1
200	22.9	26.8	105	68	102	65	83	41	80	38	85	48	82	45	36.6	18
250	26	30.2	105	66	102	63	79	36	76	33	82	46	79	43	35.3	17.3
500	35.9	44.1	100	62	97	59	64	18	61	15	70	40	67	37	29.4	17.3
600	40.4	48.9	95	61	92	58	55	12	52	9	63	38	60	35	26.6	17.3
700	44.6	–	95	–	92	–	50	–	47	–	60	–	57	–	25.8	–
800	47.7	–	93	–	90	–	45	–	42	–	57	–	54	–	25	–
900	51.6	–	90	–	87	–	38	–	35	–	53	–	50	–	23.6	–
1,000	54.8	–	88	–	85	–	33	–	30	–	48	–	45	–	22.3	–
1,100	56.9	–	87	–	84	–	30	–	27	–	44	–	41	–	21.4	–
1,300	61.4	–	80	–	77	–	21	–	18	–	39	–	36	–	18.3	–

* EN 50288-4-1(2004)/IEC 61156-5(2002)

Chemical characteristics:
Free of hazardous substances acc. to RoHS 2002/95/EG

Certificates and Approvals:
Quality mark with production control: VDE
Link-Performance: MegaLineNet® systems and further commercial cabling systems
Inspection certificate: acc. to DIN 55350-18-4.2.1 respectively EN 10204
In agreement to LVD (73/23/EEC): CE

Thermal characteristics:
Temperature range for fixed installation
-20°C up to +60°C
Temperature range for mobile operation
0°C up to +50°C

Article Number	Size	Overall diameter mm	Weight kg/km	Copper content kg/km	Colour sheath
7KS70001	4P	8.6 (approx.)	80 (approx.)	48	yellow, RAL 1021
7KS70002	2x4P	8.6 x 17.5 (approx.)	162 (approx.)	96	yellow, RAL 1021

Package: Drum 1,000 m

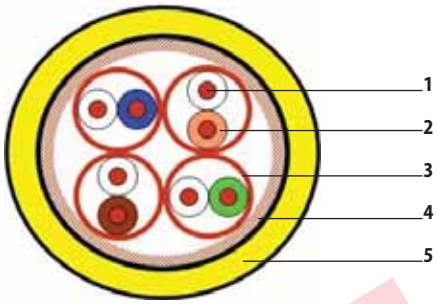
MegaLine® F10-115 S/F

$S_3 P_4 A_4 C_4 E_5$

Category: "7_A"

Type: KS-02YSCH 4x2xAWG 23/1 PIMF

Type: KS-02YSCH 2x(4x2xAWG 23/1 PIMF)



Office

Printing outer sheath:
LEONI MegaLine F10-115 S/F 4P H
SPACE CODE 34445
"VDE approval mark" "Production lot code"
"Meter marking"

Colour code: wh/bu, wh/or, wh/gn, wh/bn
Colour outer sheath: yellow, RAL 1021

Construction:

1	Conductor:	bare copper wire, AWG 23/1
2	Insulation:	cellular-PE, core-Ø: nominal value 1.4 mm
	Twisting element:	Pair
3	Individual screen:	aluminium-bonded polyester tape
	Twisting:	4 pairs
4	Overall screen:	tinned copper wire braid
5	Outer sheath:	halogen-free, flame retardant compound

Fire behaviour:
Flame retardance: acc. to IEC 60332-3-24
Halogen acid gas emission: acc. to IEC 60754-2
Smoke density: acc. to IEC 61034
Calorific value (MJ/m): 0.6 (Sx) / 1.2 (Dx) (approx.)

	1	2	3	4	5
S	IEC 60332-2-2	IEC-60332-1-2	IEC-60332-3-24	EFP Grade 1	EFP Grade 2

Security (Fire behaviour)

Performance:
better than category 7 acc. EN 50288 and IEC 61156
excellent NEXT, excellent screening characteristics (individual and overall screen), low SKEW
Bandwidth 1,150 MHz

	1	2	3	4	5
P	> Class E > 250 MHz	> Class E_A > 500 MHz	> Class F > 600 MHz	> Class F_A > 1,000 MHz	> Class „G" > 1,200 MHz

Performance (Cabling class, bandwidth)

Applications:
Installation cable for generic cabling systems acc. ISO/IEC 11801 and EN 50173 (2. edition).
Ideal for all applications of classes D up to F_A Multimedia (Video, Data, Voice) >10 GbE acc. IEEE 802.3 an, Cable sharing, VoIP, PoE

	1	2	3	4	5
A	> 100 MbE	> 1 GbE	bis 10 GbE	> 10 GbE	> 10 GbE TV

Application (Ethernet, TV)

Mechanical characteristics:
Bending radius:
during installation: 8 x overall diameter (min.)
after installation: 4 x overall diameter (min.)
Tensile strength: 110 (max.)
Crush (N/100 mm): 1,000
Impact (number of shocks): 10

	1	2	3	4	5
C	AWG 27	AWG 26/25	AWG 24	AWG 23	AWG 22

Construction (Conductor size, Tensile strength)

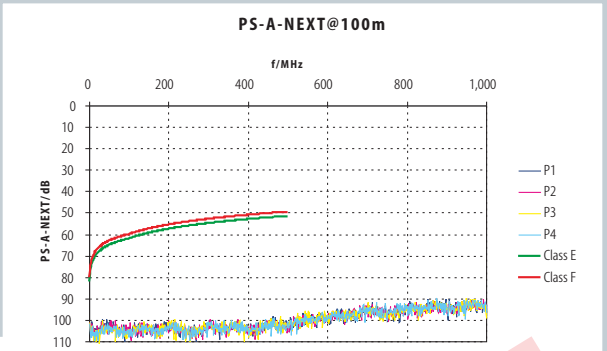
Electromagnetic behaviour:
Transfer impedance at 10 MHz (mOhm/m): 5 (nominal value)
Screening attenuation up to 1,000 MHz (dB): 70 (nominal value)
Coupling attenuation up to 1,000 MHz (dB): 85 (nominal value)

	1	2	3	4	5
E	> 40 dB	> 50 dB	> 60 dB	> 70 dB	> 80 dB

EMC (Coupling attenuation)

Electrical characteristics at 20°C:

DC resistance (Ohm/km):	75 (max.)
Insulation resistance (Gohm x km):	5 (min.)
Mutual capacitance (pF/m):	42 (approx.)
Transfer capacitance (e) (pF/km):	1,500 (approx.)
Signal velocity (c):	0.80 (approx.)
Propagation delay (ns/100m):	420 (approx.)
Skew at 100 MHz (ns/100m):	5 (approx.)
Characteristic impedance at 100 MHz (Ohm):	100 ± 5
Test voltage Ueff (V):	1,000
Operating voltage Ueff (V):	125 (max.)



Frequency MHz	Attenuation dB/100m		NEXT dB		PS-NEXT dB		ACR dB@100m		PS-ACR dB@100m		EL-FEXT dB@100m		PS-ELFEXT dB@100m		RL dB	
	typ.	Cat. 7 max.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*
1	1.9	2	105	80	102	77	104	78	101	75	98	80	95	77	26.6	23
10	4.8	5.7	105	80	102	77	101	74	98	71	103	74	100	71	35.3	25
100	16.3	18.5	105	72	102	69	89	54	86	51	89	54	86	51	39.6	20.1
200	24.3	26.8	105	68	102	65	81	41	78	38	82	48	79	45	36	18
250	27.5	30.2	105	66	102	63	78	36	75	33	79	46	76	43	34	17.3
500	37.9	44.1	100	62	97	59	62	18	59	15	67	40	64	37	29	17.3
600	42.4	48.9	95	61	92	58	53	12	50	9	60	38	57	35	25.4	17.3
700	47.2	–	95	–	92	–	48	–	45	–	57	–	54	–	24.6	–
800	50.3	–	93	–	90	–	43	–	40	–	53	–	50	–	23.5	–
900	54.6	–	90	–	87	–	35	–	32	–	49	–	46	–	22.6	–
1,000	58	–	88	–	85	–	30	–	27	–	44	–	41	–	21.5	–
1,150	61.9	–	86	–	83	–	25	–	22	–	39	–	36	–	20.6	–

* EN 50288-4-1(2004)/IEC 61156-5(2002)

Chemical characteristics:
Free of hazardous substances acc. to RoHS 2002/95/EG

Certificates and Approvals:
Quality mark with production control: VDE
Link-Performance: MegaLineNet® systems and further commercial cabling systems
Inspection certificate: acc. to DIN 55350-18-4.2.1 respectively EN 10204
In agreement to LVD (73/23/EEC): CE

Thermal characteristics:
Temperature range for fixed installation -20°C up to +60°C
Temperature range for mobile operation 0°C up to +50°C

Article Number	Size	Overall diameter mm	Weight kg/km	Copper content kg/km	Colour sheath
7KS70008	4P	7.5 (approx.)	67 (approx.)	37	yellow, RAL 1021
7KS70009	2x4P	7.5 x 15.2 (approx.)	136 (approx.)	74	yellow, RAL 1021

Package: Drum 1,000 m

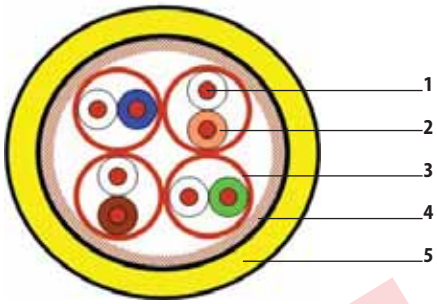
MegaLine® F6-90 S/F

$S_3 P_3 A_4 C_4 E_5$

Category: 7

Type: KS-02YSCH 4x2xAWG 23/1 PIMF

Type: KS-02YSCH 2x(4x2xAWG 23/1 PIMF)



Office

Printing outer sheath:
LEONI MegaLine F6-90 S/F 4P H
SPACE CODE 33445
"VDE approval mark" "Production lot code"
"Meter marking"

Colour code: wh/bu, wh/or, wh/gn, wh/bn
Colour outer sheath: yellow, RAL 1021

Construction:

1	Conductor:	bare copper wire, AWG 23/1
2	Insulation:	cellular-PE, core-Ø: nominal value 1.4 mm
	Twisting element:	Pair
3	Individual screen:	aluminium-bonded polyester tape
	Twisting:	4 pairs
4	Overall screen:	tinned copper wire braid
5	Outer sheath:	halogen-free, flame retardant compound

Fire behaviour:
Flame retardance: acc. to IEC 60332-3-24
Halogen acid gas emission: acc. to IEC 60754-2
Smoke density: acc. to IEC 61034
Calorific value (MJ/m): 0.6 (Sx) / 1.2 (Dx) (approx.)

	1	2	3	4	5
S	IEC 60332-2-2	IEC-60332-1-2	IEC-60332-3-24	EFP Grade 1	EFP Grade 2

Security (Fire behaviour)

Performance:
better than category 7 acc. EN 50288 and IEC 61156
excellent NEXT, excellent screening characteristics (individual and overall screen), low SKEW
Bandwidth 900 MHz

	1	2	3	4	5
P	> Class E > 250 MHz	> Class E_A > 500 MHz	> Class F > 600 MHz	> Class F_A > 1,000 MHz	> Class „G" > 1,200 MHz

Performance (Cabling class, bandwidth)

Applications:
Installation cable for generic cabling systems acc. ISO/IEC 11801 and EN 50173 (2. edition).
Ideal for all applications of classes D up to F Multimedia (Video, Data, Voice) >10 GbE acc. IEEE 802.3 an, Cable sharing, VoIP, PoE

	1	2	3	4	5
A	> 100 MbE	> 1 GbE	bis 10 GbE	> 10 GbE	> 10 GbE TV

Application (Ethernet, TV)

Mechanical characteristics:
Bending radius:
during installation: 8 x overall diameter (min.)
after installation: 4 x overall diameter (min.)
Tensile strength: 110 (max.)
Crush (N/100 mm): 1,000
Impact (number of shocks): 10

	1	2	3	4	5
C	AWG 27	AWG 26/25	AWG 24	AWG 23	AWG 22

Construction (Conductor size, Tensile strength)

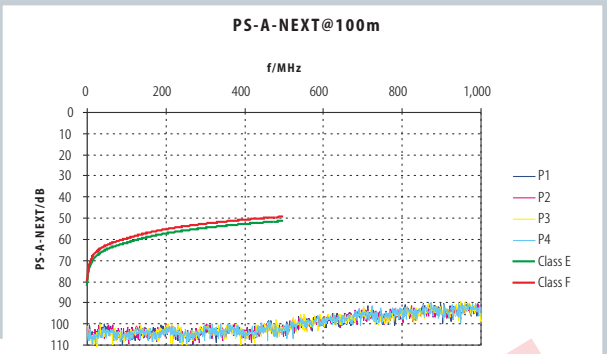
Electromagnetic behaviour:
Transfer impedance at 10 MHz (mOhm/m): 5 (nominal value)
Screening attenuation up to 1,000 MHz (dB): 70 (nominal value)
Coupling attenuation up to 1,000 MHz (dB): 85 (nominal value)

	1	2	3	4	5
E	> 40 dB	> 50 dB	> 60 dB	> 70 dB	> 80 dB

EMC (Coupling attenuation)

Electrical characteristics at 20°C:

DC resistance (Ohm/km):	75 (max.)
Insulation resistance (Gohm x km):	5 (min.)
Mutual capacitance (pF/m):	42 (approx.)
Transfer capacitance (e) (pF/km):	1,500 (approx.)
Signal velocity (c):	0.80 (approx.)
Propagation delay (ns/100m):	420 (approx.)
Skew at 100 MHz (ns/100m):	5 (approx.)
Characteristic impedance at 100 MHz (Ohm):	100 ± 5
Test voltage Ueff (V):	1,000
Operating voltage Ueff (V):	125 (max.)



Frequency MHz	Attenuation dB/100m		NEXT dB		PS-NEXT dB		ACR dB@100m		PS-ACR dB@100m		EL-FEXT dB@100m		PS-ELFEXT dB@100m		RL dB	
	typ.	Cat. 7 max.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*
1	1.9	2	102	80	99	77	101	78	98	75	109	80	106	77	25.4	23
10	4.8	5.7	102	80	99	77	98	74	95	71	108	74	105	71	31.1	25
100	16.4	18.5	102	72	99	69	86	54	83	51	93	54	90	51	33.2	20.1
200	24.5	26.8	102	68	99	65	78	41	75	38	85	48	82	45	33.2	18
250	27.8	30.2	102	66	99	63	75	36	72	33	82	46	79	43	33.4	17.3
450	36.1	41.6	97	63	94	60	61	21	58	18	72	41	69	38	31.4	17.3
500	38.2	44.1	97	62	94	59	59	18	56	15	68	40	65	37	30.5	17.3
600	42.9	48.9	92	61	89	58	49	12	46	9	62	38	59	35	27.6	17.3
700	47.7	–	92	–	89	–	44	–	41	–	59	–	56	–	26.2	–
800	50.8	–	90	–	87	–	39	–	36	–	56	–	53	–	23.9	–
900	55.1	–	85	–	82	–	30	–	27	–	52	–	49	–	21.7	–

* EN 50288-4-1(2004)/IEC 61156-5(2002)

Chemical characteristics:
Free of hazardous substances acc. to RoHS 2002/95/EG

Certificates and Approvals:
Quality mark with production control: VDE
Link-Performance: MegaLineNet® systems and further commercial cabling systems
Inspection certificate: acc. to DIN 55350-18-4.2.1 respectively EN 10204
In agreement to LVD (73/23/EEC): CE

Thermal characteristics:
Temperature range for fixed installation
-20°C up to +60°C
Temperature range for mobile operation
0°C up to +50°C

Article Number	Size	Overall diameter mm	Weight kg/km	Copper content kg/km	Colour sheath
7KS70010	4P	7.5 (approx.)	67 (approx.)	37	yellow, RAL 1021
7KS70011	2x4P	7.5 x 15.2 (approx.)	136 (approx.)	74	yellow, RAL 1021

Package: Drum 1,000 m

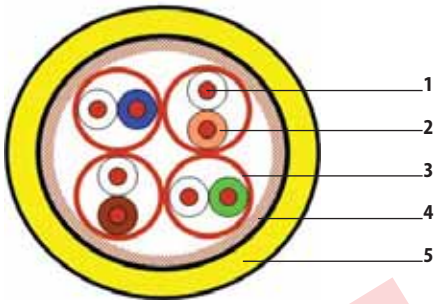
MegaLine® F6-80 S/F

$S_2 P_3 A_4 C_4 E_4$

Category: 7

Type: KS-02YSCH 4x2xAWG 23/1 PIMF

Type: KS-02YSCH 2x(4x2xAWG 23/1 PIMF)



Office

Printing outer sheath:
LEONI MegaLine F6-80 S/F 4P H
SPACE Code 23444
"Number of registration VDE 8079" "Production lot code"
"Meter marking"

Colour code: wh/bu, wh/or, wh/gn, wh/bn
Colour outer sheath: yellow, RAL 1021

Construction:

1	Conductor:	bare copper wire, AWG 23/1
2	Insulation:	cellular-PE, core-Ø: nominal value 1.4 mm
	Twisting element:	Pair
3	Individual screen:	aluminium-bonded polyester tape
	Twisting:	4 pairs
4	Overall screen:	tinned copper wire braid
5	Outer sheath:	halogen-free, flame retardant compound

Fire behaviour:
Flame retardance: acc. to IEC 60332-1-2
Halogen acid gas emission: acc. to IEC 60754-2
Smoke density: acc. to IEC 61034
Calorific value (MJ/m): 0.6 (Sx) / 1.2 (Dx) (approx.)

	1	2	3	4	5
S	IEC 60332-2-2	IEC-60332-1-2	IEC-60332-3-24	EFP Grade 1	EFP Grade 2

Security (Fire behaviour)

Performance:
better than category 7 acc. IEC 61156 excellent NEXT, excellent screening characteristics (individual and overall screen), low SKEW
Bandwidth 800 MHz

	1	2	3	4	5
P	> Class E > 250 MHz	> Class E_A > 500 MHz	> Class F > 600 MHz	> Class F_A > 1,000 MHz	> Class „G" > 1,200 MHz

Performance (Cabling class, bandwidth)

Applications:
Installation cable for generic cabling systems acc. ISO/IEC 11801 and EN 50173 (2. edition).
Ideal for all applications of classes D up to F Multimedia (Video, Data, Voice) >10 GbE acc. IEEE 802.3 an, Cable sharing, VoIP, PoE

	1	2	3	4	5
A	> 100 MbE	> 1 GbE	bis 10 GbE	> 10 GbE	> 10 GbE TV

Application (Ethernet, TV)

Mechanical characteristics:
Bending radius:
during installation: 8 x overall diameter (min.)
after installation: 4 x overall diameter (min.)
Tensile strength: 110 (max.)
Crush (N/100 mm): 1,000
Impact (number of shocks): 10

	1	2	3	4	5
C	AWG 27	AWG 26/25	AWG 24	AWG 23	AWG 22

Construction (Conductor size, Tensile strength)

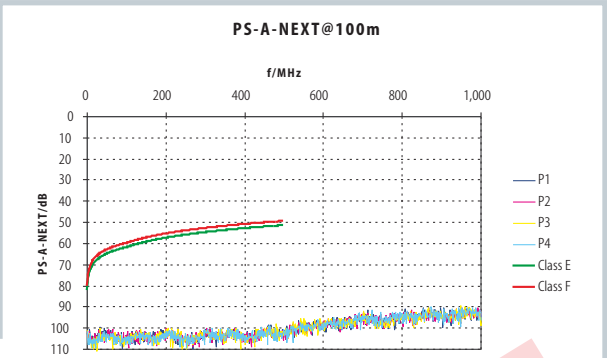
Electromagnetic behaviour:
Transfer impedance at 10 MHz (mOhm/m): 10 (nominal value)
Screening attenuation up to 1,000 MHz (dB): 60 (nominal value)
Coupling attenuation up to 1,000 MHz (dB): 80 (nominal value)

	1	2	3	4	5
E	> 40 dB	> 50 dB	> 60 dB	> 70 dB	> 80 dB

EMC (Coupling attenuation)

Electrical characteristics at 20°C:

DC resistance (Ohm/km):	75 (max.)
Insulation resistance (Gohm x km):	5 (min.)
Mutual capacitance (pF/m):	42 (approx.)
Transfer capacitance (e) (pF/km):	1,500 (approx.)
Signal velocity (c):	0.80 (approx.)
Propagation delay (ns/100m):	420 (approx.)
Skew at 100 MHz (ns/100m):	5 (approx.)
Characteristic impedance at 100 MHz (Ohm):	100 ± 5
Test voltage Ueff (V):	1,000
Operating voltage Ueff (V):	125 (max.)



Frequency MHz	Attenuation dB/100m		NEXT dB		PS-NEXT dB		ACR dB@100m		PS-ACR dB@100m		EL-FEXT dB@100m		PS-ELFEXT dB@100m		RL dB	
	typ.	Cat. 7 max.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*
1	1.9	2	99	80	96	77	98	78	95	75	89	80	86	77	25.4	23
10	5	5.9	99	80	96	77	94	74	91	71	92	74	89	71	35.1	25
100	17.1	19	99	72	96	69	82	54	79	51	85	54	82	51	36.7	20.1
200	25.5	27.5	99	68	96	65	74	41	71	38	71	48	68	45	31.7	18
250	28.9	31	99	66	96	63	71	36	68	33	67	46	64	43	29.8	17.3
450	37.5	42.7	94	63	91	60	57	21	54	18	62	41	59	38	27.5	17.3
500	39.7	45.3	94	62	91	59	54	18	51	15	61	40	58	37	27	17.3
600	44.5	50.1	89	61	86	58	44	12	41	9	57	38	54	35	26.4	17.3
700	49.5	–	89	–	86	–	39	–	36	–	54	–	51	–	27	–
800	52.8	–	87	–	84	–	34	–	31	–	51	–	48	–	18.4	–

* EN 50288-4-1(2004)/IEC 61156-5(2002)

Chemical characteristics:
Free of hazardous substances acc. to RoHS 2002/95/EG

Certificates and Approvals:
Quality mark with production control: Number of registration VDE
Link-Performance: MegaLineNet® systems and further commercial cabling systems
Inspection certificate: acc. to DIN 55350-18-4.2.1 respectively EN 10204
In agreement to LVD (73/23/EEC): CE

Thermal characteristics:
Temperature range for fixed installation
-20°C up to +60°C
Temperature range for mobile operation
0°C up to +50°C

Article Number	Size	Overall diameter mm	Weight kg/km	Copper content kg/km	Colour sheath
7KS70012	4P	7.4 (approx.)	55 (approx.)	30	yellow, RAL 1021
7KS70013	2x4P	7.4 x 15.0 (approx.)	112 (approx.)	60	yellow, RAL 1021

Package: Drum 1,000 m

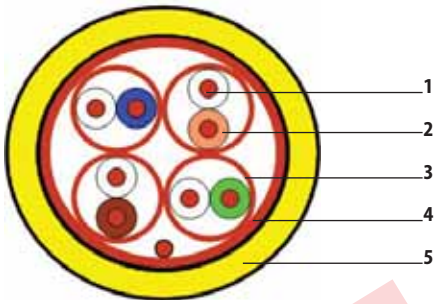
MegaLine® F6-70 F/F

$S_3 P_3 A_4 C_4 E_3$

Category: 7

Type: KS-02YS(ST)H 4x2xAWG 23/1 PIMF

Type: KS-02YS(ST)H 2x(4x2xAWG 23/1 PIMF)



Office

Printing outer sheath:
LEONI MegaLine F6-70 F/F 4P H
SPACE Code 33443
"Number of registration VDE 807" "Production lot code"
"Meter marking"

Colour code: wh/bu, wh/or, wh/gn, wh/bn
Colour outer sheath: yellow, RAL 1021

Construction:

1	Conductor:	bare copper wire, AWG 23/1
2	Insulation:	cellular-PE, core-Ø: nominal value 1.4 mm
	Twisting element:	Pair
3	Individual screen:	aluminium-bonded polyester tape
	Twisting:	4 pairs
4	Overall screen:	aluminium-bonded polyester tape, metal side inside, with underlayed tinned copper drain wire
5	Outer sheath:	halogen-free, flame retardant compound

Fire behaviour:
Flame retardance: acc. to IEC 60332-3-24
Halogen acid gas emission: acc. to IEC 60754-2
Smoke density: acc. to IEC 61034
Calorific value (MJ/m): 0.6 (Sx) / 1.2 (Dx) (approx.)

	1	2	3	4	5
S	IEC 60332-2-2	IEC-60332-1-2	IEC-60332-3-24	EFP Grade 1	EFP Grade 2

Security (Fire behaviour)

Performance:
better than category 7 acc. IEC 61156 excellent NEXT, excellent screening characteristics (individual and overall screen), low SKEW
Bandwidth 700 MHz

	1	2	3	4	5
P	> Class E > 250 MHz	> Class E_A > 500 MHz	> Class F > 600 MHz	> Class F_A > 1,000 MHz	> Class „G" > 1,200 MHz

Performance (Cabling class, bandwidth)

Applications:
Installation cable for generic cabling systems acc. ISO/IEC 11801 and EN 50173 (2. edition).
Ideal for all applications of classes D up to F Multimedia (Video, Data, Voice) >10 GbE acc. IEEE 802.3 an, Cable sharing, VoIP, PoE

	1	2	3	4	5
A	> 100 MbE	> 1 GbE	bis 10 GbE	> 10 GbE	> 10 GbE TV

Application (Ethernet, TV)

Mechanical characteristics:
Bending radius:
during installation: 8 x overall diameter (min.)
after installation: 4 x overall diameter (min.)
Tensile strength: 110 (max.)
Crush (N/100 mm): 1,000
Impact (number of shocks): 10

	1	2	3	4	5
C	AWG 27	AWG 26/25	AWG 24	AWG 23	AWG 22

Construction (Conductor size, Tensile strength)

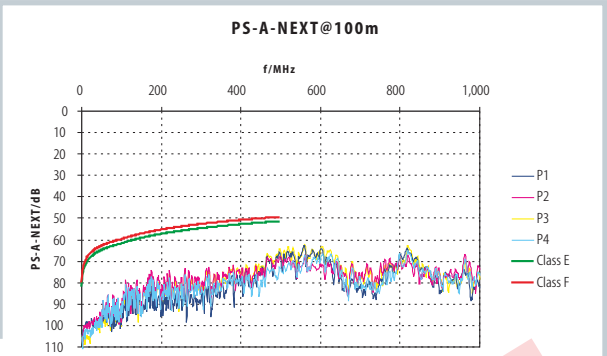
Electromagnetic behaviour:
Transfer impedance at 10 MHz (mOhm/m): 25 (nominal value)
Screening attenuation up to 1,000 MHz (dB): 60 (nominal value)
Coupling attenuation up to 1,000 MHz (dB): 75 (nominal value)

	1	2	3	4	5
E	> 40 dB	> 50 dB	> 60 dB	> 70 dB	> 80 dB

EMC (Coupling attenuation)

Electrical characteristics at 20°C:

DC resistance (Ohm/km):	82 (max.)
Insulation resistance (Gohm x km):	5 (min.)
Mutual capacitance (pF/m):	42 (approx.)
Transfer capacitance (e) (pF/km):	1,500 (approx.)
Signal velocity (c):	0.80 (approx.)
Propagation delay (ns/100m):	417 (approx.)
Skew at 100 MHz (ns/100m):	7 (approx.)
Characteristic impedance at 100 MHz (Ohm):	100 ± 5
Test voltage Ueff (V):	1,000
Operating voltage Ueff (V):	125 (max.)



Frequency MHz	Attenuation dB/100m		NEXT dB		PS-NEXT dB		ACR dB@100m		PS-ACR dB@100m		EL-FEXT dB@100m		PS-ELFEXT dB@100m		RL dB	
	typ.	Cat. 7 max.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*
1	2	2	95	80	92	77	93	78	90	75	89	80	86	77	25.4	23
10	5	5.9	90	80	87	77	85	74	82	71	92	74	89	71	35.1	25
100	17.2	19	90	72	87	69	73	53	70	50	85	54	82	51	36.7	20.1
200	25.7	27.5	90	68	87	65	64	40	61	37	71	48	68	45	31.7	18
250	29.1	31	90	66	87	63	61	35	58	32	67	46	64	43	29.8	17.3
450	37.8	42.7	80	63	77	60	42	20	39	17	62	41	59	38	27.5	17.3
500	40.1	45.3	75	62	72	59	35	17	32	14	61	40	58	37	27	17.3
600	44.9	50.1	73	61	70	58	28	11	25	8	57	38	54	35	26.4	17.3
700	50	–	70	–	67	–	20	–	17	–	54	–	51	–	27	–

* IEC 61156-5(2002)

Chemical characteristics:
Free of hazardous substances acc. to RoHS 2002/95/EG

Certificates and Approvals:
Quality mark with production control: Number of registration VDE
Link-Performance: MegaLineNet® systems and further commercial cabling systems
Inspection certificate: acc. to DIN 55350-18-4.2.1 respectively EN 10204
In agreement to LVD (73/23/EEC): CE

Thermal characteristics:
Temperature range for fixed installation
-20°C up to +60°C
Temperature range for mobile operation
0°C up to +50°C

Article Number	Size	Overall diameter mm	Weight kg/km	Copper content kg/km	Colour sheath
7KS70043	4P	7.5 (approx.)	58 (approx.)	23.5	yellow, RAL 1021
7KS70044	2x4P	7.5 x 15.4 (approx.)	120 (approx.)	47	yellow, RAL 1021

Package: Drum 1,000 m

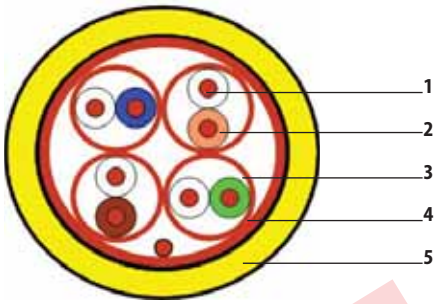
MegaLine® E5-70 F/F

$S_3 P_2 A_3 C_4 E_3$

Category: "6_A"

Type: KS-02YS(ST)H 4x2xAWG 23/1 PIMF

Type: KS-02YS(ST)H 2x(4x2xAWG 23/1 PIMF)



Office

Printing outer sheath:
LEONI MegaLine E5-70 F/F 4P H
SPACE Code 32343
"VDE approval mark" "Production lot code"
"Meter marking"

Colour code: wh/bu, wh/or, wh/gn, wh/bn
Colour outer sheath: yellow, RAL 1021

Construction:

1	Conductor:	bare copper wire, AWG 23/1
2	Insulation:	cellular-PE, core-Ø: nominal value 1,4 mm
	Twisting element:	Pair
3	Individual screen:	aluminium-bonded polyester tape
	Twisting:	4 pairs
4	Overall screen:	aluminium-bonded polyester tape, metal side inside, with underlayed tinned copper drain wire
5	Outer sheath:	halogen-free, flame retardant compound

Fire behaviour:
Flame retardance: acc. to IEC 60332-3-24
Halogen acid gas emission: acc. to IEC 60754-2
Smoke density: acc. to IEC 61034
Calorific value (MJ/m): 0,6 (Sx) / 1,2 (Dx) (approx.)

S	1	2	3	4	5
	IEC 60332-2-2	IEC-60332-1-2	IEC-60332-3-24	EFP Grade 1	EFP Grade 2

Security (Fire behaviour)

Performance:
better than category 6 acc. EN 50288 and IEC 61156
very good NEXT, good screening characteristics (individual and overall screen), low SKEW
Bandwidth 700 MHz

P	1	2	3	4	5
	> Class E > 250 MHz	> Class E_A > 500 MHz	> Class F > 600 MHz	> Class F_A > 1,000 MHz	> Class „G" > 1,200 MHz

Performance (Cabling class, bandwidth)

Applications:
Installation cable for generic cabling systems acc. ISO/IEC 11801 and EN 50173 (2. edition).
Ideal for all applications of classes D up to E_A up to 10 GbE acc. IEEE 802.3 an,
Cable sharing, VoIP, PoE

A	1	2	3	4	5
	> 100 MbE	> 1 GbE	bis 10 GbE	> 10 GbE	> 10 GbE TV

Application (Ethernet, TV)

Mechanical characteristics:
Bending radius:
during installation: 8 x overall diameter (min.)
after installation: 4 x overall diameter (min.)
Tensile strength: 110 (max.)
Crush (N/100 mm): 1,000
Impact (number of shocks): 10

C	1	2	3	4	5
	AWG 27	AWG 26/25	AWG 24	AWG 23	AWG 22

Construction (Conductor size, Tensile strength)

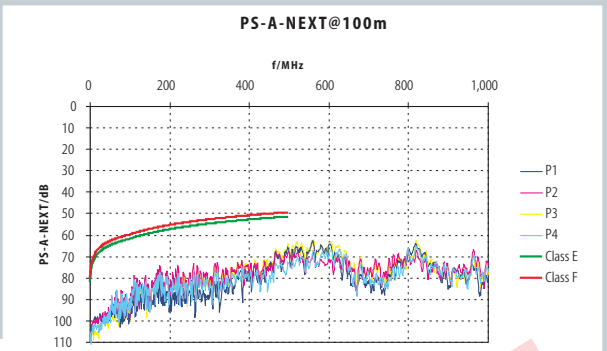
Electromagnetic behaviour:
Transfer impedance at 10 MHz (mOhm/m): 50 (nominal value)
Screening attenuation up to 1,000 MHz (dB): 60 (nominal value)
Coupling attenuation up to 1,000 MHz (dB): 70 (nominal value)

E	1	2	3	4	5
	> 40 dB	> 50 dB	> 60 dB	> 70 dB	> 80 dB

EMC (Coupling attenuation)

Electrical characteristics at 20°C:

DC resistance (Ohm/km):	82 (max.)
Insulation resistance (Gohm x km):	5 (min.)
Mutual capacitance (pF/m):	42 (approx.)
Transfer capacitance (e) (pF/km):	1,500 (approx.)
Signal velocity (c):	0.80 (approx.)
Propagation delay (ns/100m):	417 (approx.)
Skew at 100 MHz (ns/100m):	7 (approx.)
Characteristic impedance at 100 MHz (Ohm):	100 ± 5
Test voltage Ueff (V):	1,000
Operating voltage Ueff (V):	125 (max.)



Frequency MHz	Attenuation dB/100m		NEXT dB		PS-NEXT dB		ACR dB@100m		PS-ACR dB@100m		EL-FEXT dB@100m		PS-ELFEXT dB@100m		RL dB	
	typ.	Cat. 6 max.*	typ.	Cat. 6 min.*	typ.	Cat. 6 min.*	typ.	Cat. 6 min.*	typ.	Cat. 6 min.*	typ.	Cat. 6 min.*	typ.	Cat. 6 min.*	typ.	Cat. 6 min.*
1	1.9	2	95	66	92	64	93	64	90	62	91	66	88	63	25.1	-
10	5.2	5.9	90	59	87	57	85	53	82	51	96	57	93	54	35.2	25
100	17.7	19	75	44	72	42	57	25	54	23	90	42	87	39	37.2	20.1
200	26.4	27.5	68	40	65	38	42	12	39	10	78	38	75	35	31.1	18
250	29.9	31	66	38	63	36	36	7	33	5	75	36	72	33	29.5	17.3
300	31.9	34.2	65	37	62	35	33	3	30	1	72	35	69	32	28.3	17.3
450	38.9	42.7	63	35	60	33	24	-8	21	-10	69	33	66	30	26.7	17.3
500	41.2	45.3	61	34	58	32	20	-11	17	-13	66	32	63	29	26.3	17.3
600	46.2	-	57	-	54	-	11	-	8	-	60	–	57	–	25.8	–
700	51.4	-	54	-	51	–	3	–	0	–	56	–	53	–	-	–

* EN 50288-10-1 (draft)/EN 50288-5-1(2004)/IEC 61156-5(2002)

Chemical characteristics:
Free of hazardous substances acc. to RoHS 2002/95/EG

Certificates and Approvals:
Quality mark with production control: ᴠ VDE ᴡ
Link-Performance: MegaLineNet® systems and further commercial cabling systems
Inspection certificate: acc. to DIN 55350-18-4.2.1 respectively EN 10204
In agreement to LVD (73/23/EEC): CE

Thermal characteristics:
Temperature range for fixed installation
-20°C up to +60°C
Temperature range for mobile operation
0°C up to +50°C

Article Number	Size	Overall diameter mm	Weight kg/km	Copper content kg/km	Colour sheath
7KS60022	4P	7.5 (approx.)	58 (approx.)	23.5	yellow, RAL 1021
7KS60023	2x4P	7.5 x 15.2 (approx.)	120 (approx.)	47	yellow, RAL 1021

Package: Drum 1,000 m

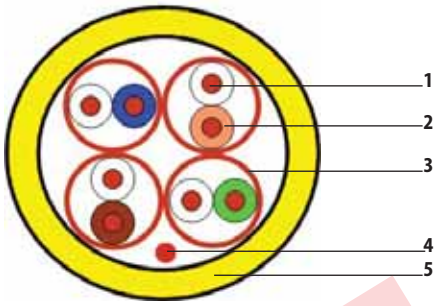
MegaLine® E5-60 U/F

$S_3 P_2 A_3 C_4 E_2$

Category: "6_A"

Type: KS-02YSH 4x2xAWG 23/1 PIMF

Type: KS-02YSH 2x(4x2xAWG 23/1 PIMF)



Office

Printing outer sheath:
LEONI MegaLine E5-60 U/F 4P H
SPACE Code 32342
"VDE approval mark" "Production lot code"
"Meter marking"

Colour code: wh/bu, wh/or, wh/gn, wh/bn
Colour outer sheath: yellow, RAL 1021

Construction:

1	Conductor:	bare copper wire, AWG 23/1
2	Insulation:	cellular-PE, core-Ø: nominal value 1.4 mm
	Twisting element:	Pair
3	Individual screen:	aluminium-bonded polyester tape
	Twisting:	4 pairs
4	Tape:	plastic foil (optional) with underlayed tinned copper drain wire AWG 24/1
5	Outer sheath:	halogen-free, flame retardant compound

Fire behaviour:
Flame retardance: acc. to IEC 60332-3-24
Halogen acid gas emission: acc. to IEC 60754-2
Smoke density: acc. to IEC 61034
Calorific value (MJ/m): 0.6 (Sx) / 1.2 (Dx) (approx.)

S	1	2	3	4	5
	IEC 60332-2-2	IEC-60332-1-2	IEC-60332-3-24	EFP Grade 1	EFP Grade 2

Security (Fire behaviour)

Performance:
better than category 6 acc. EN 50288 and IEC 61156
very good NEXT, low SKEW
Bandwidth 600 MHz

P	1	2	3	4	5
	> Class E > 250 MHz	> Class E_A > 500 MHz	> Class F > 600 MHz	> Class F_A > 1,000 MHz	> Class „G" > 1,200 MHz

Performance (Cabling class, bandwidth)

Applications:
Installation cable for generic cabling systems acc. ISO/IEC 11801 and EN 50173 (2. edition).
Ideal for all applications of classes D up to E_A up to 10 GbE acc. IEEE 802.3 an, Cable sharing, VoIP, PoE

A	1	2	3	4	5
	> 100 MbE	> 1 GbE	bis 10 GbE	> 10 GbE	> 10 GbE TV

Application (Ethernet, TV)

Mechanical characteristics:
Bending radius:
during installation: 8 x overall diameter (min.)
after installation: 4 x overall diameter (min.)
Tensile strength: 110 (max.)
Crush (N/100 mm): 1,000
Impact (number of shocks): 10

C	1	2	3	4	5
	AWG 27	AWG 26/25	AWG 24	AWG 23	AWG 22

Construction (Conductor size, Tensile strength)

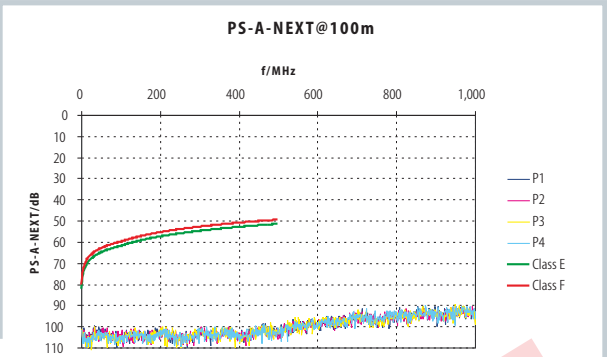
Electromagnetic behaviour:
Transfer impedance at 10 MHz (mOhm/m): 60 (nominal value)
Screening attenuation up to 1,000 MHz (dB): 55 (nominal value)
Coupling attenuation up to 1,000 MHz (dB): 60 (nominal value)

E	1	2	3	4	5
	> 40 dB	> 50 dB	> 60 dB	> 70 dB	> 80 dB

EMC (Coupling attenuation)

Electrical characteristics at 20°C:

DC resistance (Ohm/km):	82 (max.)
Insulation resistance (Gohm x km):	5 (min.)
Mutual capacitance (pF/m):	42 (approx.)
Transfer capacitance (e) (pF/km):	1,500 (approx.)
Signal velocity (c):	0.80 (approx.)
Propagation delay (ns/100m):	420 (approx.)
Skew at 100 MHz (ns/100m):	7 (approx.)
Characteristic impedance at 100 MHz (Ohm):	100 ± 5
Test voltage Ueff (V):	1,000
Operating voltage Ueff (V):	125 (max.)



Frequency MHz	Attenuation dB/100m		NEXT dB		PS-NEXT dB		ACR dB@100m		PS-ACR dB@100m		EL-FEXT dB@100m		PS-ELFEXT dB@100m		RL dB	
	typ.	Cat. 6 max.*	typ.	Cat. 6 min.*	typ.	Cat. 6 min.*	typ.	Cat. 6 min.*	typ.	Cat. 6 min.*	typ.	Cat. 6 min.*	typ.	Cat. 6 min.*	typ.	Cat. 6 min.*
1	1.9	2	95	66	92	64	93	64	90	62	91	66	88	63	25.1	-
10	5.2	5.9	90	59	87	57	85	53	82	51	96	57	93	54	35.2	25
100	17.7	19	75	44	72	42	57	25	54	23	90	42	87	39	37.2	20.1
200	26.4	27.5	68	40	65	38	42	12	39	10	78	38	75	35	31.1	18
250	29.9	31	66	38	63	36	36	7	33	5	75	36	72	33	29.5	17.3
300	31.9	34.2	65	37	62	35	33	3	30	1	72	35	69	32	28.3	17.3
450	38.9	42.7	63	35	60	33	24	-8	21	-10	69	33	66	30	26.7	17.3
500	41.2	45.3	61	34	58	32	20	-11	17	-13	66	32	63	29	26.3	17.3
600	46.2	-	57	–	54	–	11	–	8	–	60	–	57	–	25.8	–

* EN 50288-10-1 (draft)/EN 50288-5-1(2004)/IEC

Chemical characteristics:
Free of hazardous substances acc. to RoHS 2002/95/EG

Certificates and Approvals:
Quality mark with production control: VDE
Link-Performance: MegaLineNet® systems and further commercial cabling systems
Inspection certificate: acc. to DIN 55350-18-4.2.1 respectively EN 10204
In agreement to LVD (73/23/EEC): CE

Thermal characteristics:
Temperature range for fixed installation
-20°C up to +60°C
Temperature range for mobile operation
0°C up to +50°C

Article Number	Size	Overall diameter mm	Weight kg/km	Copper content kg/km	Colour sheath
7KS60035	4P	7.4 (approx.)	57 (approx.)	25	yellow, RAL 1021
7KS60036	2X4P	7.4 X 15.0 (approx.)	117 (approx.)	50	yellow, RAL 1021

Package: Drum 1,000 m

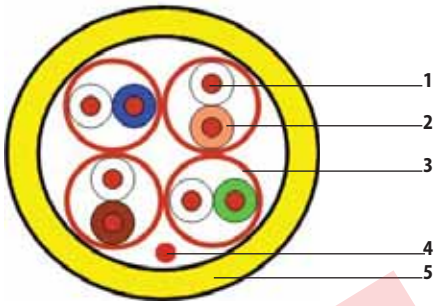
MegaLine® E2-45 U/F

$S_2 P_1 A_2 C_4 E_2$

Category: 6

Type: KS-02YSH 4x2xAWG 23/1 PIMF

Type: KS-02YSH 2X(4x2xAWG 23/1 PIMF)



Office

Printing outer sheath:
LEONI MegaLine E2-45 U/F 4P H
SPACE Code 21242
"VDE approval mark" "Production lot code"
"Meter marking"

Colour code: wh/bu, wh/or, wh/gn, wh/bn
Colour outer sheath: yellow, RAL 1021

Construction:

1	Conductor:	bare copper wire, AWG 23/1
2	Insulation:	cellular-PE, core-Ø: nominal value 1.4 mm
	Twisting element:	Pair
3	Individual screen:	aluminium-bonded polyester tape
	Twisting:	4 pairs
4	Tape:	plastic foil (optional) with underlayed tinned copper drain wire AWG 24/1
5	Outer sheath:	halogen-free, flame retardant compound

Fire behaviour:
Flame retardance: acc. to IEC 60332-1-2
Halogen acid gas emission: acc. to IEC 60754-2
Smoke density: acc. to IEC 61034
Calorific value (MJ/m): 0.6 (Sx) / 1.2 (Dx) (approx.)

S	1	2	3	4	5
	IEC 60332-2-2	IEC-60332-1-2	IEC-60332-3-24	EFP Grade 1	EFP Grade 2

Security (Fire behaviour)

Performance:
better than category 6 acc. EN 50288 and IEC 61156 very good NEXT, low SKEW
Bandwidth 450 MHz

P	1	2	3	4	5
	> Class E > 250 MHz	> Class E_A > 500 MHz	> Class F > 600 MHz	> Class F_A > 1,000 MHz	> Class „G" > 1,200 MHz

Performance (Cabling class, bandwidth)

Applications:
Installation cable for generic cabling systems acc. ISO/IEC 11801 and EN 50173 (2. edition).
Ideal for all applications of classes D up to E up to 1 GbE acc. IEEE 802.3 ab, Cable sharing, VoIP, PoE

A	1	2	3	4	5
	> 100 MbE	> 1 GbE	bis 10 GbE	> 10 GbE	> 10 GbE TV

Application (Ethernet, TV)

Mechanical characteristics:
Bending radius:
during installation: 8 x overall diameter (min.)
after installation: 4 x overall diameter (min.)
Tensile strength: 110 (max.)
Crush (N/100 mm): 1,000
Impact (number of shocks): 10

C	1	2	3	4	5
	AWG 27	AWG 26/25	AWG 24	AWG 23	AWG 22

Construction (Conductor size, Tensile strength)

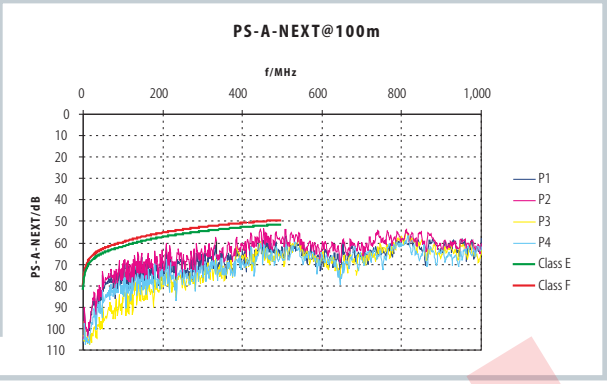
Electromagnetic behaviour:
Transfer impedance at 10 MHz (mOhm/m): 80 (nominal value)
Screening attenuation up to 1,000 MHz (dB): 50 (nominal value)
Coupling attenuation up to 1,000 MHz (dB): 60 (nominal value)

E	1	2	3	4	5
	> 40 dB	> 50 dB	> 60 dB	> 70 dB	> 80 dB

EMC (Coupling attenuation)

Electrical characteristics at 20°C:

DC resistance (Ohm/km):	82 (max.)
Insulation resistance (Gohm x km):	5 (min.)
Mutual capacitance (pF/m):	42 (approx.)
Transfer capacitance (e) (pF/km):	1,500 (approx.)
Signal velocity (c):	0.80 (approx.)
Propagation delay (ns/100m):	420 (approx.)
Skew at 100 MHz (ns/100m):	7 (approx.)
Characteristic impedance at 100 MHz (Ohm):	100 ± 5
Test voltage Ueff (V):	1,000
Operating voltage Ueff (V):	125 (max.)



Frequency MHz	Attenuation dB/100m		NEXT dB		PS-NEXT dB		ACR dB@100m		PS-ACR dB@100m		EL-FEXT dB@100m		PS-ELFEXT dB@100m		RL dB	
	typ.	Cat. 6 max.*	typ.	Cat. 6 min.*	typ.	Cat. 6 min.*	typ.	Cat. 6 min.*	typ.	Cat. 6 min.*	typ.	Cat. 6 min.*	typ.	Cat. 6 min.*	typ.	Cat. 6 min.*
1	1.9	2.1	95	66	92	64	93	64	90	62	88	66	85	64	25.4	-
4	3.2	3.8	95	65	92	63	92	61	89	59	89	58	86	55	28.6	23
10	5.2	6	90	59	87	57	85	53	82	51	92	50	89	47	33.5	25
16	7	7.6	90	56	87	54	83	49	80	47	98	46	95	43	35.6	25
31.25	9.9	10.7	85	52	82	50	75	41	72	39	98	40	95	37	37	23.6
62.5	13.5	15.5	80	47	77	45	66	32	63	30	95	34	92	31	35.9	21.5
100	17.9	19.9	75	44	72	42	57	24	54	22	88	30	85	27	34.3	20.1
155	22.5	25.3	72	41	69	39	49	16	46	14	81	26	78	23	32.2	18.8
200	26.9	29.1	68	40	65	38	41	11	38	9	75	24	72	21	31.3	18
250	30.4	33	66	38	63	36	36	5	33	3	72	22	69	19	29.2	17.3
300	33.1	-	65	–	62	–	32	–	29	–	69	–	66	–	28	–
450	39.3	–	63	–	60	–	24	–	21	–	64	–	61	–	27	–

* EN 50288-5-1(2004)/IEC 61156-5(2002)

Chemical characteristics:
Free of hazardous substances acc. to RoHS 2002/95/EG

Certificates and Approvals:
Quality mark with production control: VDE
Link-Performance: MegaLineNet® systems and further commercial cabling systems
Inspection certificate: acc. to DIN 55350-18-4.2.1 respectively EN 10204
In agreement to LVD (73/23/EEC): CE

Thermal characteristics:
Temperature range for fixed installation
-20°C up to +60°C
Temperature range for mobile operation
0°C up to +50°C

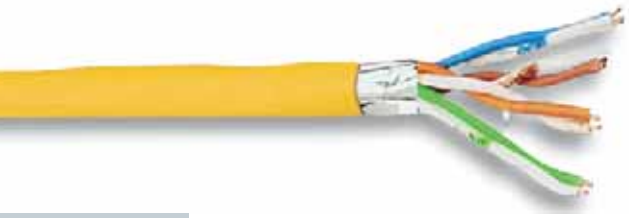
Article Number	Size	Overall diameter mm	Weight kg/km	Copper content kg/km	Colour sheath
7KS60005	4P	7.4 (approx.)	55 (approx.)	23.5	yellow, RAL 1021
7KS60006	2x4P	7.4 x 15.0 (approx.)	114 (approx.)	47	yellow, RAL 1021

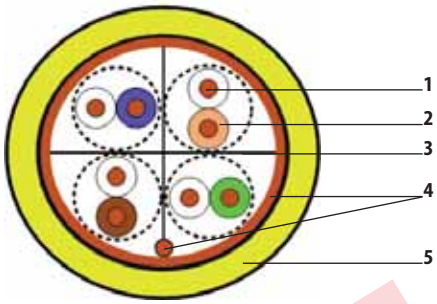
Package: Drum 1,000 m

MegaLine® E2-30 F/U

$S_2 P_1 A_2 C_4 E_2$ Type: KS-2Y(ST)H 4x2xAWG 23/1

Category: 6





Office

Printing outer sheath:
LEONI MegaLine E2-30 F/U 4P H
SPACE Code 21242
"Production lot code" "Meter marking"

Colour code: whbu/bu, whor/or, whgn/gn, whbn/bn
Colour outer sheath: yellow, RAL 1021

Construction:

1	Conductor:	bare copper wire, AWG 23/1
2	Insulation:	PE
	Twisting element:	Pair
3	Twisting:	4 pairs separated by a cross element
4	Overall screen:	aluminium-bonded polyester tape, metal side inside, with underlayed tinned copper drain wire
5	Outer sheath:	halogen-free, flame retardant compound

Fire behaviour:
Flame retardance: acc. to IEC 60332-1-2
Halogen acid gas emission: acc. to IEC 60754-2
Smoke density: acc. to IEC 61034
Calorific value (MJ/m): 0,7 (approx.)

	1	2	3	4	5
S	IEC 60332-2-2	IEC-60332-1-2	IEC-60332-3-24	EFP Grade 1	EFP Grade 2

Security (Fire behaviour)

Performance:
better than category 6 acc. EN 50288 and IEC 61156
Bandwidth 300 MHz

	1	2	3	4	5
P	> Class E > 250 MHz	> Class E_A > 500 MHz	> Class F > 600 MHz	> Class F_A > 1,000 MHz	> Class „G" > 1,200 MHz

Performance (Cabling class, bandwidth)

Applications:
Installation cable for generic cabling systems acc. ISO/IEC 11801 and EN 50173 (2. edition).
Ideal for all applications of classes D up to E up to 1 GbE acc. IEEE 802.3 ab, VoIP, PoE

	1	2	3	4	5
A	> 100 MbE	> 1 GbE	bis 10 GbE	> 10 GbE	> 10 GbE TV

Application (Ethernet, TV)

Mechanical characteristics:
Bending radius:
during installation: 8 x overall diameter (min.)
after installation: 4 x overall diameter (min.)
Tensile strength: 110 (max.)
Crush (N/100 mm): 1,000
Impact (number of shocks): 10

	1	2	3	4	5
C	AWG 27	AWG 26/25	AWG 24	AWG 23	AWG 22

Construction (Conductor size, Tensile strength)

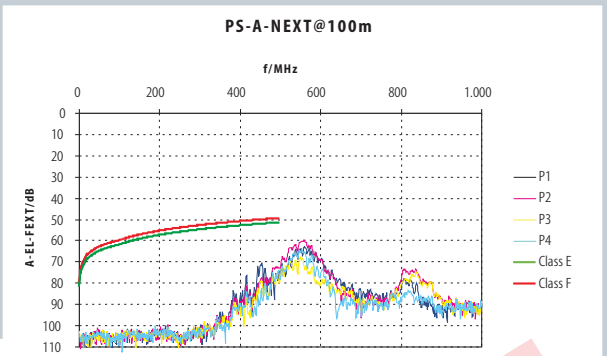
Electromagnetic behaviour:
Transfer impedance at 10 MHz (mOhm/m): 40 (nominal value
Screening attenuation up to 1,000 MHz (dB): 50 (nominal value)
Coupling attenuation up to 1,000 MHz (dB): 70 (nominal value)

	1	2	3	4	5
E	> 40 dB	> 50 dB	> 60 dB	> 70 dB	> 80 dB

EMC (Coupling attenuation)

Electrical characteristics at 20°C:

DC resistance (Ohm/km):	75 (max.)
Insulation resistance (Gohm x km):	5 (min.)
Mutual capacitance (pF/m):	56 (approx.)
Transfer capacitance (e) (pF/km):	1,500 (approx.)
Signal velocity (c):	0.71 (approx.)
Propagation delay (ns/100m):	480 (approx.)
Skew at 100 MHz (ns/100m):	25 (approx.)
Characteristic impedance at 100 MHz (Ohm):	100 ± 5
Test voltage Ueff (V):	1,000
Operating voltage Ueff (V):	125 (max.)



Frequency MHz	Attenuation dB/100m		NEXT dB		PS-NEXT dB		ACR dB@100m		PS-ACR dB@100m		EL-FEXT dB@100m		PS-ELFEXT dB@100m		RL dB	
	typ.	Cat. 6 max.*	typ.	Cat. 6 min.*	typ.	Cat. 6 min.*	typ.	Cat. 6 min.*	typ.	Cat .6 min.*	typ.	Cat. 6 min.*	typ.	Cat. 6 min.*	typ.	Cat. 6 min.*
1	1.8	2.1	93	66	90	64	91	64	88	62	103	66	100	64	24.6	-
4	2.9	3.8	87	65	84	63	84	61	81	59	95	58	92	55	30.8	23
10	5.1	6	80	59	77	57	75	53	72	51	85	50	82	47	36.7	25
16	7	7.6	75	56	72	54	68	49	65	47	78	46	75	43	38.4	25
32.25	10	10.9	71	52	68	50	61	41	58	39	71	40	68	37	37.9	23.6
62.5	13.5	15.5	67	47	64	45	53	32	50	30	65	34	62	31	35.5	21.5
100	17.8	19.9	63	44	60	42	45	24	42	22	60	30	57	27	31.9	20.1
155	22.4	25.3	59	41	56	39	37	16	34	14	53	26	50	23	28.7	18.8
200	26.8	29.1	57	40	54	38	30	11	27	9	48	24	45	21	25.9	18
250	30.4	33	56	38	53	36	26	5	23	3	44	22	41	19	25.5	17.3
300	32.8	–	53	–	50	–	20	-	17	-	38	-	35	-	23.6	–

* EN 50288-6-1(2004)/IEC 61156-5(2002)

Certificates and Approvals:

Link-Performance: MegaLineNet® systems and further commercial cabling systems
Inspection certificate: acc. to DIN 55350-18-4.2.1 respectively EN 10204
In agreement to LVD (73/23/EEC): CE

Thermal characteristics:

Temperature range for fixed installation
-20°C up to +60°C
Temperature range for mobile operation
0°C up to +50°C

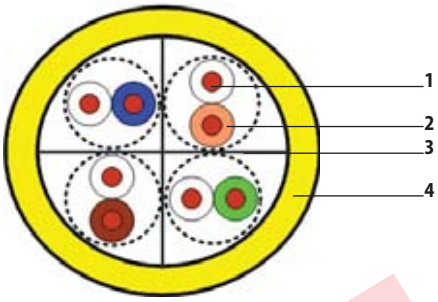
Article Number	Size	Overall diameter mm	Weight kg/km	Copper content kg/km	Colour sheath
7KS60004	4P	7.2 (approx.)	55 (approx.)	21	yellow, RAL 1021

Package: Drum 1,000 m

MegaLine® E2-30 U/U

$S_2 P_1 A_2 C_4 E_1$ Type: KS-2YH 4x2xAWG 23/1

Category: 6



Office

Printing outer sheath:
LEONI MegaLine E2-30 U/U 4P H
SPACE Code 21241
"Production lot code" "Meter marking"

Colour code: whbu/bu, whor/or, whgn/gn, whbn/bn
Colour outer sheath: yellow, RAL 1021

Construction:

1	Conductor:	bare copper wire, AWG 23/1
2	Insulation:	PE
	Twisting element:	Pair
3	Twisting:	4 pairs separated by a cross element
	Tape:	plastic foil (optional)
4	Outer sheath:	halogen-free, flame retardant compound

Fire behaviour:
Flame retardance: acc. to IEC 60332-1-2
Halogen acid gas emission: acc. to IEC 60754-2
Smoke density: acc. to IEC 61034
Calorific value (MJ/m): 0.65 (approx.)

S	1 IEC 60332-2-2	2 IEC-60332-1-2	3 IEC-60332-3-24	4 EFP Grade 1	5 EFP Grade 2

Security (Fire behaviour)

Performance:
better than category 6 acc. EN 50288 and IEC 61156
Bandwidth 300 MHz

P	1 > Class E > 250 MHz	2 > Class E_A > 500 MHz	3 > Class F > 600 MHz	4 > Class F_A > 1,000 MHz	5 > Class „G" > 1,200 MHz

Performance (Cabling class, bandwidth)

Applications:
Installation cable for generic cabling systems acc. ISO/IEC 11801 and EN 50173 (2. edition).
Suitable for all applications of classes D up to E up to 1 GbE acc. IEEE 802.3 ab, VoIP, PoE

A	1 > 100 MbE	2 > 1 GbE	3 bis 10 GbE	4 > 10 GbE	5 > 10 GbE TV

Application (Ethernet, TV)

Mechanical characteristics:
Bending radius:
during installation: 8 x overall diameter (min.)
after installation: 4 x overall diameter (min.)
Tensile strength: 110 (max.)
Crush (N/100 mm): 1,000
Impact (number of shocks): 10

C	1 AWG 27	2 AWG 26/25	3 AWG 24	4 AWG 23	5 AWG 22

Construction (Conductor size, Tensile strength)

Electromagnetic behaviour:
Coupling attenuation up to 1,000 MHz (dB):
45 (nominal value)

E	1 > 40 dB	2 > 50 dB	3 > 60 dB	4 > 70 dB	5 > 80 dB

EMC (Coupling attenuation)

Electrical characteristics at 20°C:

DC resistance (Ohm/km):	78 (max.)
Insulation resistance (Gohm x km):	5 (min.)
Mutual capacitance (pF/m):	50 (approx.)
Transfer capacitance (e) (pF/km):	1,500 (approx.)
Signal velocity (c):	0.67 (approx.)
Propagation delay (ns/100m):	528 (approx.)
Skew at 100 MHz (ns/100m):	30 (approx.)
Characteristic impedance at 100 MHz (Ohm):	100 ± 5
Test voltage Ueff (V):	1,000
Operating voltage Ueff (V):	125 (max.)

Frequency MHz	Attenuation dB/100m		NEXT dB		PS-NEXT dB		ACR dB@100m		PS-ACR dB@100m		EL-FEXT dB@100m		PS-ELFEXT dB@100m		RL dB	
	typ.	Cat. 6 max.*	typ.	Cat. 6 min.*	typ.	Cat. 6 min.*	typ.	Cat. 6 min.*	typ.	Cat. 6 min.*	typ.	Cat. 6 min.*	typ.	Cat. 6 min.*	typ.	Cat. 6 min.*
1	1.8	2.1	94	66	91	64	92	64	89	62	102	66	99	64	25.4	-
4	2.7	3.8	88	65	85	63	85	61	82	59	96	58	93	55	30.3	23
10	4.7	6	81	59	78	57	76	53	73	51	85	50	82	47	33.9	25
16	6.6	7.6	76	56	73	54	70	49	67	47	78	46	75	43	33.6	25
32.25	9.5	10.9	72	52	69	50	62	41	59	39	70	40	67	37	33.7	23.6
62.5	13	15.5	68	47	65	45	55	32	52	30	63	34	60	31	34.4	21.5
100	17.4	19.9	64	44	61	42	46	24	43	22	57	30	54	27	33.5	20.1
155	22	25.3	60	41	57	39	38	16	35	14	50	26	47	23	32.2	18.8
200	26.6	29.1	58	40	55	38	31	11	28	9	45	24	42	21	30.5	18
250	30.4	33	57	38	54	36	27	5	24	3	40	22	37	19	29	17.3
300	33.1	–	54	–	51	–	20	–	17	–	37	–	34	–	27	–

* EN 50288-6-1(2004)/IEC 61156-5(2002

Certificates and Approvals:
Link-Performance: MegaLineNet® systems and further commercial cabling systems
Inspection certificate: acc. to DIN 55350-18-4.2.1 respectively EN 10204
In agreement to LVD (73/23/EEC): CE

Thermal characteristics:
Temperature range for fixed installation
-20°C up to +60°C
Temperature range for mobile operation
0°C up to +50°C

Article Number	Size	Overall diameter mm	Weight kg/km	Copper content kg/km	Colour sheath
7KS60002	4P	6.4 (approx.)	45 (approx.)	22	yellow, RAL 1021

Package: Drum 1,000 m/500 m, box 305 m

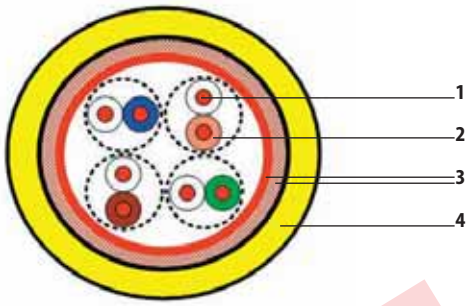
MegaLine® D1-20 SF/U

$S_2 P_0 A_1 C_3 E_3$

Category: 5

Type: KS-02YS(ST+C)H 4x2xAWG 24/1

Type: KS-02YS(ST+C)H 2x(4x2xAWG 24/1)



Office

Printing outer sheath:
LEONI MegaLine D1-20 SF/U 4P H
SPACE Code 20133
"Production lot code" "Meter marking"

Colour code: whbu/bu, whor/or, whgn/gn, whbn/bn
Colour outer sheath: yellow, RAL 1021

Construction:

1	Conductor:	bare copper wire, AWG 24/1
2	Insulation:	cellular-PE, core-Ø: nominal value 1.1 mm
	Twisting element:	Pair
	Twisting:	4 pairs
3	Overall screen:	aluminum-bonded polyester tape and tinned copper wire braid
4	Outer sheath:	halogen-free, flame retardant compound

Fire behaviour:
Flame retardance: acc. to IEC 60332-1-2
Halogen acid gas emission: acc. to IEC 60754-2
Smoke density: acc. to IEC 61034
Calorific value (MJ/m): 0.4 (Sx) / 0.8 (Dx) (approx.)

	1	2	3	4	5
S	IEC 60332-2-2	**IEC-60332-1-2**	IEC-60332-3-24	EFP Grade 1	EFP Grade 2

Security (Fire behaviour)

Performance:
better than category 5 acc. EN 50288 and IEC 61156
very good screening characteristics
Bandwidth 200 MHz

	1	2	3	4	5
P	> Class E > 250 MHz	> Class E_A > 500 MHz	> Class F > 600 MHz	> Class F_A > 1,000 MHz	> Class „G" > 1,200 MHz

Performance (Cabling class, bandwidth)

Applications:
Installation cable for generic cabling systems acc. ISO/IEC 11801 and EN 50173 (2. edition).
Ideal for all applications of class D up to 1 GbE acc. IEEE 802.3 ab, VoIP, PoE

	1	2	3	4	5
A	**> 100 MbE**	> 1 GbE	bis 10 GbE	> 10 GbE	> 10 GbE TV

Application (Ethernet, TV)

Mechanical characteristics:
Bending radius:
during installation: 8 x overall diameter (min.)
after installation: 4 x overall diameter (min.)
Tensile strength: 85 (max.)
Crush (N/100 mm): 1,000
Impact (number of shocks): 10

	1	2	3	4	5
C	AWG 27	AWG 26/25	**AWG 24**	AWG 23	AWG 22

Construction (Conductor size, Tensile strength)

Electromagnetic behaviour:
Transfer impedance at 10 MHz (mOhm/m): 10 (nominal value)
Screening attenuation up to 1,000 MHz (dB): 55 (nominal value)
Coupling attenuation up to 1,000 MHz (dB): 70 (nominal value)

	1	2	3	4	5
E	> 40 dB	> 50 dB	**> 60 dB**	> 70 dB	> 80 dB

EMC (Coupling attenuation)

Electrical characteristics at 20°C:

DC resistance (Ohm/km):	95 (max.)
Insulation resistance (Gohm x km):	5 (min.)
Mutual capacitance (pF/m):	45 (approx.)
Transfer capacitance (e) (pF/km):	1,500 (approx.)
Signal velocity (c):	0.75 (approx.)
Propagation delay (ns/100m):	440 (approx.)
Skew at 100 MHz (ns/100m):	15 (approx.)
Characteristic impedance at 100 MHz (Ohm):	100 ± 5
Test voltage Ueff (V):	1,000
Operating voltage Ueff (V):	125 (max.)

Frequency MHz	Attenuation dB/100m		NEXT dB		PS-NEXT dB		ACR dB@100m		PS-ACR dB@100m		EL-FEXT dB@100m		PS-ELFEXT dB@100m		RL dB	
	typ.	Cat. 5 max.*	typ.	Cat. 5 min.*	typ.	Cat. 5 min.*	typ.	Cat. 5 min.*	typ.	Cat. 5 min.*	typ.	Cat. 5 min.*	typ.	Cat. 5 min.*	typ.	Cat. 5 min.*
1	2	2.1	75	65	72	62	73	63	70	60	89	64	86	61	24.8	-
4	3.1	4	69	56	66	53	66	52	63	49	84	52	81	49	28.6	23
10	5.1	6.3	62	50	59	47	57	44	54	41	76	44	73	41	33.3	25
16	7	8	58	47	55	44	51	39	48	36	70	40	67	37	34.3	25
31.25	9.7	11.4	53	43	50	40	44	31	41	28	63	34	60	31	33.9	23.6
62.5	13.2	16.5	49	38	46	35	36	22	33	19	58	28	55	25	31.3	21.5
100	17.6	21.3	45	35	42	32	28	14	25	11	52	24	49	21	27.7	20.1
155	22.3	–	42	–	39	–	20	–	17	–	49	–	46	–	24.7	–
200	26.5	–	40	–	37	–	14	–	11	-	45	–	42	–	22.4	–

* EN 50288-2-1(2004)/IEC 61156-5(2002)

Chemical characteristics:
Free of hazardous substances acc. to RoHS 2002/95/EG

Certificates and Approvals:
Link-Performance: MegaLineNet® systems and further commercial cabling systems
Inspection certificate: acc. to DIN 55350-18-4.2.1 respectively EN 10204
In agreement to LVD (73/23/EEC): CE

Thermal characteristics:
Temperature range for fixed installation
-20°C up to +60°C
Temperature range for mobile operation
0°C up to +50°C

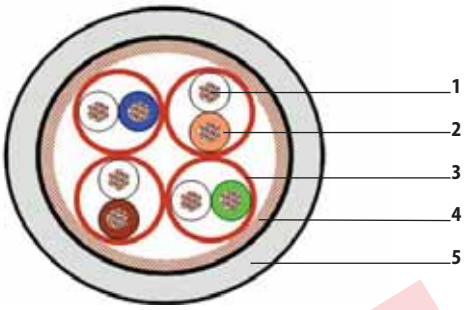
Article Number	Size	Overall diameter mm	Weight kg/km	Copper content kg/km	Colour sheath
7KS50005	4P	6.0 (approx.)	42 (approx.)	26	yellow, RAL 1021
7KS50006	2x4P	6.0 x 12.5 (approx.)	86 (approx.)	52	yellow, RAL 1021

Package: Drum 1,000 m

MegaLine® F10-120 S/F flex

$S_2 P_4 A_5 C_2 E_5$ Type: KS-02YSCH 4x2xAWG 26/7 PIMF

Category: "7_A"



Office

Printing outer sheath:
LEONI MegaLine F10-120 S/F flex 4P H
SPACE Code 24525
"VDE approval mark" "Production lot code"
"Meter marking"

Colour code: ws/bl, ws/or, ws/gn, ws/br
Colour outer sheath: grey, RAL 7035

Construction:

1	Conductor:	bare stranded copper wire, AWG 26/7
2	Insulation:	cellular-PE, core-Ø: nominal value 1.0 mm
	Twisting element:	Pair
3	Individual screen:	aluminium-bonded polyester tape
	Twisting:	4 pairs
4	Overall screen:	tinned copper wire braid
5	Outer sheath:	halogen-free, flame retardant compound

Fire behaviour:
Flame retardance: acc. to IEC 60332-1-2
Halogen acid gas emission: acc. to IEC 60754-2
Smoke density: acc. to IEC 61034
Calorific value (MJ/m): 0.38 (approx.)

	1	2	3	4	5
S	IEC 60332-2-2	IEC-60332-1-2	IEC-60332-3-24	EFP Grade 1	EFP Grade 2

Security (Fire behaviour)

Performance:
better than category 7 acc. EN 50288 and IEC 61156
excellent NEXT, low attenuation, excellent screening characteristics (individual and overall screen),
low SKEW
Bandwidth 1,200 MHz

	1	2	3	4	5
P	> Class E > 250 MHz	> Class E_A > 500 MHz	> Class F > 600 MHz	> Class F_A > 1,000 MHz	> Class „G" > 1,200 MHz

Performance (Cabling class, bandwidth)

Applications:
Connecting cable and patch cord for generic cabling systems acc. ISO/IEC 11801 and EN 50173 (2. edition) and for residential cabling and SOHO acc. ISO/IEC 15018 and EN 50173-4 (draft).
Ideal for all applications of classes D up to F_A Multimedia (TV, Video, Data, Voice) >10 GbE acc. IEEE 802.3 an,
Cable sharing, VoIP, PoE

	1	2	3	4	5
A	> 100 MbE	> 1 GbE	bis 10 GbE	> 10 GbE	> 10 GbE TV

Application (Ethernet, TV)

Mechanical characteristics:
Bending radius:
during operation: min. 5 x overall diameter
Tensile strength: 60 (max.)

	1	2	3	4	5
C	AWG 27	AWG 26/25	AWG 24	AWG 23	AWG 22

Construction (Conductor size, Tensile strength)

Electromagnetic behaviour:
Transfer impedance at 10 MHz (mOhm/m): 5 (nominal value)
Screening attenuation up to 1,000 MHz (dB): 60 (nominal value)
Coupling attenuation up to 1,000 MHz (dB): 85 (nominal value)

	1	2	3	4	5
E	> 40 dB	> 50 dB	> 60 dB	> 70 dB	> 80 dB

EMC (Coupling attenuation)

Electrical characteristics at 20°C:

DC resistance (Ohm/km):	150 (max.)
Insulation resistance (Gohm x km):	5 (min.)
Mutual capacitance (pF/m):	42 (approx.)
Signal velocity (c):	0.72 (approx.)
Propagation delay (ns/100m):	460 (approx.)
Skew at 100 MHz (ns/100m):	2.5 (approx.)
Characteristic impedance at 100 MHz (Ohm):	100 ± 5
Test voltage Ueff (V):	1,000
Operating voltage Ueff (V):	125 (max.)

Frequency MHz	Attenuation dB/10m		NEXT dB		PS-NEXT dB		ACR dB@10m		PS-ACR dB@10m		EL-FEXT dB@10m		PS-ELFEXT dB@10m		RL dB	
	typ.	Cat. 7 max.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*
1	0.25	0.29	100	80	97	77	100	80	97	77	100	80	97	80	24	23
10	0.76	0.85	99	80	96	77	99	79	96	77	95	74	92	71	33.9	25
100	2.49	2.78	95	72	92	69	93	70	90	69	69	54	66	51	38.3	20.1
200	3.69	4.01	92	68	89	65	88	64	85	65	65	48	62	45	35.3	18
250	4.18	4.53	90	66	87	63	86	62	83	63	62	46	59	43	32.9	17.3
500	5.6	6.62	83	62	80	59	78	55	75	59	54	40	51	37	29.7	17.3
600	6.74	7.33	81	61	78	58	74	53	71	58	50	38	47	35	30.6	17.3
700	7.32	–	80	–	77	–	72	–	69	–	50	–	47	–	31	–
800	7.89	–	77	–	74	–	69	–	66	–	50	–	47	–	26.7	–
900	8.5	–	75	–	72	–	67	–	64	–	34	–	31	–	28.6	–
1,000	9.11	–	74	–	71	–	65	–	62	–	32	–	29	–	27.5	–
1,100	9.5	–	72	–	69	–	63	–	60	–	28	–	25	–	26.9	–
1,200	9.9	–	70	–	67	–	61	–	58	–	24	–	21	–	26.3	–

* EN 50288-4-2(2004)/IEC 61156-6(2002)

Chemical characteristics:
Free of hazardous substances acc. to RoHS 2002/95/EG

Certificates and Approvals:
Quality mark with production control: VDE
Link-Performance: MegaLineNet® systems and further commercial cabling systems
Inspection certificate: acc. to DIN 55350-18-4.2.1 respectively EN 10204
In agreement to LVD (73/23/EEC): CE

Thermal characteristics:
Temperature range for fixed installation
-20°C up to +60°C
Temperature range for mobile operation
0°C up to +50°C

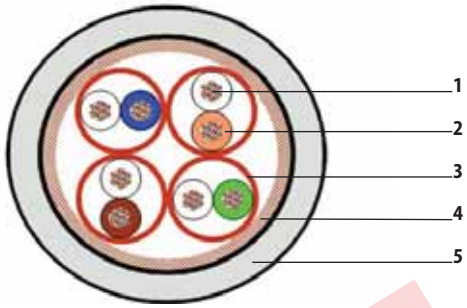
Article Number	Size	Overall diameter mm	Weight kg/km	Copper content kg/km	Colour sheath
7KS70003	4P	6.0 (approx.)	42 (approx.)	23.5	grey, RAL 7035

Package: Drum 1,000 m

MegaLine® F6-90 S/F flex

$S_2 P_3 A_4 C_1 E_5$ Type: KS-02YSCH 4x2xAWG 27/7 PIMF

Category: 7



Office

Printing outer sheath:
LEONI MegaLine F6-90 S/F flex 4P H
SPACE Code 23415
"Number of registration VDE 8080" "Production lot code"
"Meter marking"

Colour code: wh/bu, wh/or, wh/gn, wh/bn
Colour outer sheath: grey, RAL 7035

Construction:

1	Conductor:	bare stranded copper wire, AWG 27/7
2	Insulation:	cellular-PE, core-Ø: nominal value 1.0 mm
	Twisting element:	Pair
3	Individual screen:	aluminium-bonded polyester tape
	Twisting:	4 pairs
4	Overall screen:	tinned copper wire braid
5	Outer sheath:	halogen-free, flame retardant compound

Fire behaviour:
Flame retardance: acc. to IEC 60332-1-2
Halogen acid gas emission: acc. to IEC 60754-2
Smoke density: acc. to IEC 61034
Calorific value (MJ/m): 0.33 (approx.)

	1	2	3	4	5
S	IEC 60332-2-2	IEC-60332-1-2	IEC-60332-3-24	EFP Grade 1	EFP Grade 2

Security (Fire behaviour)

Performance:
better than category 7 acc. EN 50288 and IEC 61156
excellent NEXT, excellent screening characteristics (individual and overall screen), low SKEW
Bandwidth 900 MHz

	1	2	3	4	5
P	> Class E > 250 MHz	> Class E_A > 500 MHz	> Class F > 600 MHz	> Class F_A > 1,000 MHz	> Class „G" > 1,200 MHz

Performance (Cabling class, bandwidth)

Applications:
Connecting cable and patch cord for generic cabling systems acc. ISO/IEC 11801 and EN 50173 (2. edition).
Ideal for all applications of classes D up to F Multimedia (Video, Data, Voice) >10 GbE acc. IEEE 802.3 an, Cable sharing, VoIP, PoE

	1	2	3	4	5
A	> 100 MbE	> 1 GbE	bis 10 GbE	> 10 GbE	> 10 GbE TV

Application (Ethernet, TV)

Mechanical characteristics:
Bending radius:
during operation: min. 5 x overall diameter
Tensile strength: 40 (max.)

	1	2	3	4	5
C	AWG 27	AWG 26/25	AWG 24	AWG 23	AWG 22

Construction (Conductor size, Tensile strength)

Electromagnetic behaviour:
Transfer impedance at 10 MHz (mOhm/m): 5 (nominal value)
Screening attenuation up to 1,000 MHz (dB): 60 (nominal value)
Coupling attenuation up to 1,000 MHz (dB): 80 (nominal value)

	1	2	3	4	5
E	> 40 dB	> 50 dB	> 60 dB	> 70 dB	> 80 dB

EMC (Coupling attenuation)

Electrical characteristics at 20°C:

DC resistance (Ohm/km):	170 (max.)
Insulation resistance (Gohm x km):	5 (min.)
Mutual capacitance (pF/m):	44 (approx.)
Signal velocity (c):	0.78 (approx.)
Propagation delay (ns/100m):	430 (approx.)
Skew at 100 MHz (ns/100m):	2.5 (approx.)
Characteristic impedance at 100 MHz (Ohm):	100 ± 5
Test voltage Ueff (V):	1,000
Operating voltage Ueff (V):	125 (max.)

Frequency MHz	Attenuation dB/10m		NEXT dB		PS-NEXT dB		ACR dB@10m		PS-ACR dB@10m		EL-FEXT dB@10m		PS-ELFEXT dB@10m		RL dB	
	typ.	Cat. 7 max.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*
1	0.26	0.29	95	80	92	77	95	80	92	77	92	80	89	80	21.8	-
10	0.83	0.85	94	80	91	77	94	79	91	77	84	74	81	71	29.7	25
100	2.74	2.78	90	72	87	69	88	70	85	69	70	54	67	51	35	20.1
200	3.9	4.01	87	68	84	65	83	64	80	65	60	48	57	45	33	18
250	4.39	4.53	85	66	82	63	81	62	78	63	56	46	53	43	31.6	17.3
500	6.21	6.62	78	62	75	59	72	55	69	59	52	40	49	37	28.8	17.3
600	6.91	7.33	76	61	73	58	69	53	66	58	48	38	45	35	27.1	17.3
700	7.48	–	75	–	72	–	67	–	64	–	34	–	31	–	26.4	–
800	8.06	–	72	–	69	–	64	–	61	–	34	–	31	–	24.7	–
900	8.62	–	70	-	67	–	62	–	59	–	11	–	8	–	24.4	–

* EN 50288-4-2(2004)/IEC 61156-6(2002

Chemical characteristics:
Free of hazardous substances acc. to RoHS 2002/95/EG

Certificates and Approvals:
Quality mark with production control: Number of registration VDE
Link-Performance: MegaLineNet® systems and further commercial cabling systems
Inspection certificate: acc. to DIN 55350-18-4.2.1 respectively EN 10204
In agreement to LVD (73/23/EEC): CE

Thermal characteristics:
Temperature range for fixed installation
-20°C up to +60°C
Temperature range for mobile operation
0°C up to +50°C

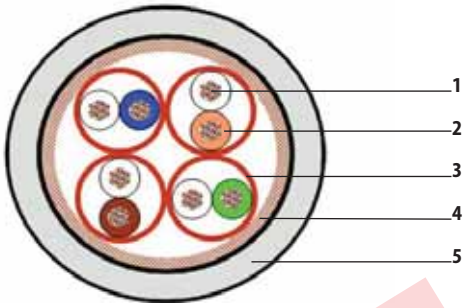
Article Number	Size	Overall diameter mm	Weight kg/km	Copper content kg/km	Colour sheath
7KS70014	4P	5.7 (approx.)	34 (approx.)	17	grey, RAL 7035

Package: Drum 1,000 m

MegaLine® E5-70 S/F flex

$S_2 P_2 A_3 C_1 E_4$ Type: KS-02YSCH 4x2xAWG 27/7 PIMF

Category: "6_A"



Office

Printing outer sheath:
LEONI MegaLine E5-70 S/F flex 4P H
SPACE Code 22314
"Number of registration VDE 8108" "Production lot code"
"Meter marking"

Colour code: wh/bu, wh/or, wh/gn, wh/bn
Colour outer sheath: grey, RAL 7035

Construction:

1	Conductor:	bare stranded copper wire, AWG 27/7
2	Insulation:	cellular-PE, core-Ø: nominal value 1.0 mm
	Twisting element:	Pair
3	Individual screen:	aluminium-bonded polyester tape
	Twisting:	4 pairs
4	Overall screen:	tinned copper wire braid
5	Outer sheath:	halogen-free, flame retardant compound

Fire behaviour:
Flame retardance: acc. to IEC 60332-1-2
Halogen acid gas emission: acc. to IEC 60754-2
Smoke density: acc. to IEC 61034
Calorific value (MJ/m): 0,33 (approx.)

	1	2	3	4	5
S	IEC 60332-2-2	IEC-60332-1-2	IEC-60332-3-24	EFP Grade 1	EFP Grade 2

Security (Fire behaviour)

Performance:
better than category 6 acc. EN 50288 and IEC 61156
very good NEXT, very good screening characteristics (individual and overall screen), low SKEW
Bandwidth 700 MHz

	1	2	3	4	5
P	> Class E > 250 MHz	> Class E_A > 500 MHz	> Class F > 600 MHz	> Class F_A > 1,000 MHz	> Class „G" > 1,200 MHz

Performance (Cabling class, bandwidth)

Applications:
Connecting cable and patch cord for generic cabling systems acc. ISO/IEC 11801 and EN 50173 (2. edition).
Ideal for all applications of classes D up to E_A Multimedia (Video, Data, Voice) up to 10 GbE acc. IEEE 802.3 an, Cable sharing, VoIP, PoE

	1	2	3	4	5
A	> 100 MbE	> 1 GbE	bis 10 GbE	> 10 GbE	> 10 GbE TV

Application (Ethernet, TV)

Mechanical characteristics:
Bending radius:
during operation: min. 5 x overall diameter
Tensile strength: 40 (max.)

	1	2	3	4	5
C	AWG 27	AWG 26/25	AWG 24	AWG 23	AWG 22

Construction (Conductor size, Tensile strength)

Electromagnetic behaviour:
Transfer impedance at 10 MHz (mOhm/m): 5 (nominal value)
Screening attenuation up to 1,000 MHz (dB): 60 (nominal value)
Coupling attenuation up to 1,000 MHz (dB): 80 (nominal value)

	1	2	3	4	5
E	> 40 dB	> 50 dB	> 60 dB	> 70 dB	> 80 dB

EMC (Coupling attenuation)

Electrical characteristics at 20°C:

DC resistance (Ohm/km):	170 (max.)
Insulation resistance (Gohm x km):	5 (min.)
Mutual capacitance (pF/m):	44 (approx.)
Signal velocity (c):	0.78 (approx.)
Propagation delay (ns/100m):	430 (approx.)
Skew at 100 MHz (ns/100m):	2.5 (approx.)
Characteristic impedance at 100 MHz (Ohm):	100 ± 5
Test voltage Ueff (V):	1,000
Operating voltage Ueff (V):	125 (max.)

Frequency MHz	Attenuation dB/10m		NEXT dB		PS-NEXT dB		ACR dB@10m		PS-ACR dB@10m		EL-FEXT dB@10m		PS-ELFEXT dB@10m		RL dB	
	typ.	Cat. 6 max.*	typ.	Cat. 6 min.*	typ.	Cat. 6 min.*	typ.	Cat. 6 min.*	typ.	Cat. 6 min.*	typ.	Cat. 6 min.*	typ.	Cat. 6 min.*	typ.	Cat. 6 min.*
1	0.29	0.30	90	66	87	64	90	66	87	64	95	66	92	63	22.7	-
4	0.43	0.56	90	65	87	63	90	65	87	63	98	63	95	60	26.8	25
10	071	088	90	59	87	57	89	58	86	57	101	57	98	54	32.5	27.1
16	0.97	1.11	90	56	87	54	89	55	86	54	98	54	95	51	35.7	25.7
31.25	1.46	1.56	90	52	87	50	89	50	86	50	89	50	86	47	38.9	17.3
62.5	2	2.23	90	47	87	45	88	45	85	45	78	45	75	42	41	17.3
100	2.68	2.85	90	44	87	65	87	41	84	65	68	42	65	39	39.2	17.3
155	3.2	3.6	87	41	84	39	84	38	81	39	61	39	58	36	37.4	17.3
200	3.81	4.12	85	40	82	38	81	36	78	38	58	38	55	35	35.1	17.3
250	4.31	4.65	83	38	80	36	79	34	76	36	56	36	53	33	33.2	17.3
300	4.87	5.13	80	37	77	35	75	32	72	35	56	35	53	32	31.8	17.3
450	5.9	6.4	75	35	72	33	69	28	66	33	48	33	45	30	29.7	17.3
500	6.73	6.79	72	34	69	32	65	27	62	32	38	32	35	29	28.8	17.3
600	7.47	-	69	-	66	-	62	-	59	-	32	-	29	-	28.7	-
700	8.15	-	65	-	61	-	57	-	53	-	29	-	26	-	25.3	-

*EN 50288-10-1 (draft)/EN 50288-5-2(2004)/IEC 61156-6(2002)

Chemical characteristics:
Free of hazardous substances acc. to RoHS 2002/95/EG

Thermal characteristics:
Temperature range for fixed installation -20°C up to +60°C
Temperature range for mobile operation 0°C up to +50°C

Certificates and Approvals:
Quality mark with production control: Number of registration VDE
Link-Performance: MegaLineNet® systems and further commercial cabling systems
Inspection certificate: acc. to DIN 55350-18-4.2.1 respectively EN 10204
In agreement to LVD (73/23/EEC): CE

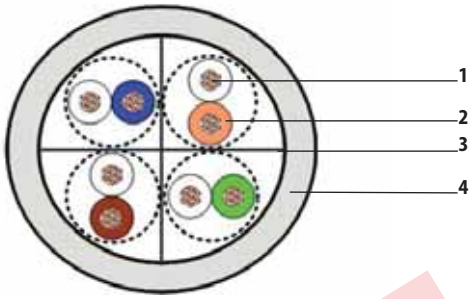
Article Number	Size	Overall diameter mm	Weight kg/km	Copper content kg/km	Colour sheath
7KS60009	4P	5.7 (approx.)	34 (approx.)	17	grey, RAL 7035
7KS60010	4P	5.7 (approx.)	34 (approx.)	17	yellow, RAL 1021
7KS60011	4P	5.7 (approx.)	34 (approx.)	17	green, RAL 6016
7KS60012	4P	5.7 (approx.)	34 (approx.)	17	blue, RAL 5015
7KS60013	4P	5.7 (approx.)	34 (approx.)	17	red, RAL 3000

Package: Drum 1,000 m

MegaLine® E2-30 U/U flex

$S_2 P_1 A_2 C_3 E_1$ Type: KS-02YSH 4x2xAWG 24/7

Category: 6



Office

Printing outer sheath:
LEONI MegaLine E2-30 U/U flex 4P H
SPACE Code 21231
"Production lot code" "Meter marking"

Colour code: whbu/bu, whor/or, whgn/gn, whbn/bn
Colour outer sheath: grey, RAL 7035

Construction:

1	Conductor:	bare stranded copper wire, AWG 24/7
2	Insulation:	cellular-PE
	Twisting element:	Pair
3	Twisting:	4 pairs separated by a cross element
4	Outer sheath:	halogen-free, flame retardant compound

Fire behaviour:
Flame retardance: acc. to IEC 60332-1-2
Halogen acid gas emission: acc. to IEC 60754-2
Smoke density: acc. to IEC 61034
Calorific value (MJ/m): 0.60 (approx.)

	1	2	3	4	5
S	IEC 60332-2-2	IEC-60332-1-2	IEC-60332-3-24	EFP Grade 1	EFP Grade 2

Security (Fire behaviour)

Performance:
better than category 6 acc. EN 50288 and IEC 61156
Bandwidth 300 MHz

	1	2	3	4	5
P	> Class E > 250 MHz	> Class E_A > 500 MHz	> Class F > 600 MHz	> Class F_A > 1,000 MHz	> Class „G" > 1,200 MHz

Performance (Cabling class, bandwidth)

Applications:
Connecting cable and patch cord for generic cabling systems acc. ISO/IEC 11801 and EN 50173 (2. edition).
Suitable for all applications of classes D up to E up to 1 GbE acc. IEEE 802.3 ab, VoIP, PoE

	1	2	3	4	5
A	> 100 MbE	> 1 GbE	bis 10 GbE	> 10 GbE	> 10 GbE TV

Application (Ethernet, TV)

Mechanical characteristics:
Bending radius:
during operation: min. 5 x overall diameter
Tensile strength: 80 (max.)

	1	2	3	4	5
C	AWG 27	AWG 26/25	AWG 24	AWG 23	AWG 22

Construction (Conductor size, Tensile strength)

Electromagnetic behaviour:
Coupling attenuation up to 1,000 MHz (dB):
45 (nominal value)

	1	2	3	4	5
E	> 40 dB	> 50 dB	> 60 dB	> 70 dB	> 80 dB

EMC (Coupling attenuation)

Electrical characteristics at 20°C:

DC resistance (Ohm/km):	88 (max.)
Insulation resistance (Gohm x km):	5 (min.)
Mutual capacitance (pF/m):	50 (approx.)
Signal velocity (c):	0.67 (approx.)
Propagation delay (ns/100m):	500 (approx.)
Skew at 100 MHz (ns/100m):	35 (approx.)
Characteristic impedance at 100 MHz (Ohm):	100 ± 5
Test voltage Ueff (V):	1,000
Operating voltage Ueff (V):	125 (max.)

Frequency MHz	Attenuation dB/10m		NEXT dB		PS-NEXT dB		ACR dB@10m		PS-ACR dB@10m		EL-FEXT dB@10m		PS-ELFEXT dB@10m		RL dB	
	typ.	Cat. 6 max.*	typ.	Cat. 6 min.*	typ.	Cat. 6 min.*	typ.	Cat. 6 min.*	typ.	Cat. 6 min.*	typ.	Cat. 6 min.*	typ.	Cat. 6 min.*	typ.	Cat. 6 min.*
1	0.23	0.31	88	66	85	64	88	66	85	64	82	66	79	64	24.7	-
4	0.42	0.57	75	65	72	63	75	65	72	63	77	58	74	55	29.2	23
10	0.68	0.90	70	59	67	57	69	58	66	57	70	50	67	47	32.5	25
16	0.93	1.14	66	56	63	54	65	55	62	54	63	46	60	43	33.1	25
31.25	1.41	1.61	63	52	60	50	61	50	58	50	56	40	53	37	33.1	23.6
62.5	1.92	2.32	60	47	57	45	58	45	55	45	50	34	47	31	33.6	21.5
100	2.58	2.99	57	44	54	42	55	41	52	42	43	30	40	27	31.6	20.1
155	3.07	3.79	55	41	52	39	52	38	49	39	35	26	32	23	29.7	18.8
200	3.66	4.37	53	40	50	38	50	35	47	38	27	24	24	21	26.9	18
250	4.14	4.95	52	38	49	36	48	33	45	36	21	22	18	19	25.8	17.3
300	4.68	–	50	–	47	–	46	–	43	–	14	–	11	–	25.2	–

* EN 50288-6-2(2004)/IEC 61156-6(2002)

Chemical characteristics:
Free of hazardous substances acc. to RoHS 2002/95/EG

Certificates and Approvals:
Link-Performance: MegaLineNet® systems and further commercial cabling systems
Inspection certificate: acc. to DIN 55350-18-4.2.1 respectively EN 10204
In agreement to LVD (73/23/EEC): CE

Thermal characteristics:
Temperature range for fixed installation
-20°C up to +60°C
Temperature range for mobile operation
0°C up to +50°C

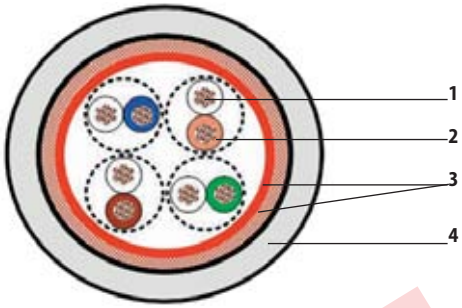
Article Number	Size	Overall diameter mm	Weight kg/km	Copper content kg/km	Colour sheath
7KS60007	4P	6.2 (approx.)	45 (approx.)	19.5	grey, RAL 7035

Package: Drum 1,000 m

MegaLine® D1-20 SF/U flex

$S_2 P_0 A_1 C_2 E_3$ Type: KS-02YS(ST+C)Y 4x2xAWG 26/7

Category: 5



Office

Printing outer sheath:
LEONI MegaLine D1-20 SF/U flex 4P Y
SPACE Code 20123
"Production lot code" "Meter marking"

Colour code: whbu/bu, whor/or, whgn/gn, whbn/bn
Colour outer sheath: grey, RAL 7035

Construction:

1	Conductor:	bare stranded copper wire, AWG 26/7
2	Insulation:	cellular-PE, core-Ø: 1.0 mm
	Twisting element:	Pair
	Twisting:	4 pairs
3	Overall screen:	aluminum-bonded polyester tape and tinned copper wire braid
4	Outer sheath:	PVC

Fire behaviour:
Flame retardance: acc. to IEC 60332-1-2
Calorific value (MJ/m): 0.35 (approx.)

	1	2	3	4	5
S	IEC 60332-2-2	**IEC-60332-1-2**	IEC-60332-3-24	EFP Grade 1	EFP Grade 2

Security (Fire behaviour)

Performance:
better than category 5 acc. EN 50288 and IEC 61156
very good screening characteristics
Bandwidth 200 MHz

	1	2	3	4	5
P	> Class E > 250 MHz	> Class E_A > 500 MHz	> Class F > 600 MHz	> Class F_A > 1,000 MHz	> Class „G" > 1,200 MHz

Performance (Cabling class, bandwidth)

Applications:
Connecting cable and patch cord for generic cabling systems acc. ISO/IEC 11801 and EN 50173 (2. edition).
Ideal for all applications of class D up to 1 GbE acc. IEEE 802.3 ab, VoIP, PoE

	1	2	3	4	5
A	**> 100 MbE**	> 1 GbE	bis 10 GbE	> 10 GbE	> 10 GbE TV

Application (Ethernet, TV)

Mechanical characteristics:
Bending radius:
during operation: min. 5 x overall diameter
Tensile strength: 60 (max.)

	1	2	3	4	5
C	AWG 27	**AWG 26/25**	AWG 24	AWG 23	AWG 22

Construction (Conductor size, Tensile strength)

Electromagnetic behaviour:
Transfer impedance at 10 MHz (mOhm/m): 10 (nominal value)
Screening attenuation up to 1,000 MHz (dB): 50 (nominal value)
Coupling attenuation up to 1,000 MHz (dB): 65 (nominal value)

	1	2	3	4	5
E	> 40 dB	> 50 dB	**> 60 dB**	> 70 dB	> 80 dB

EMC (Coupling attenuation)

Electrical characteristics at 20°C:

DC resistance (Ohm/km):	145 (max.)
Insulation resistance (Gohm x km):	5 (min.)
Mutual capacitance (pF/m):	47 (approx.)
Signal velocity (c):	0.69 (approx.)
Propagation delay (ns/100m):	485 (approx.)
Skew at 100 MHz (ns/100m):	15 (approx.)
Characteristic impedance at 100 MHz (Ohm):	100 ± 5
Test voltage Ueff (V):	1,000
Operating voltage Ueff (V):	125 (max.)

Frequency MHz	Attenuation dB/10m		NEXT dB		PS-NEXT dB		ACR dB@10m		PS-ACR dB@10m		EL-FEXT dB@10m		PS-ELFEXT dB@10m		RL dB	
	typ.	Cat. 5 max.*	typ.	Cat. 5 min.*	typ.	Cat. 5 min.*	typ.	Cat. 5 min.*	typ.	Cat. 5 min.*	typ.	Cat. 5 min.*	typ.	Cat. 5 min.*	typ.	Cat. 5 min.*
1	0.24	0.32	76	65	73	62	76	65	73	62	91	64	88	61	24.9	-
4	0.44	0.60	71	56	68	53	70	56	67	53	76	52	73	49	29.8	23
10	0.80	0.95	64	50	61	47	63	49	60	47	68	44	65	41	38.2	25
16	1.01	1.21	60	47	57	44	59	46	56	44	64	40	61	37	39.3	25
31.25	1.44	1.71	56	43	53	40	54	41	51	40	58	34	55	31	36.7	23.6
62.5	2.07	2.48	52	38	49	35	50	36	47	35	52	28	49	25	35	21.5
100	2.66	3.2	48	35	45	32	45	32	42	32	47	24	44	21	29.9	20.1
155	3.26	–	45	–	42	–	42	–	39	–	42	–	39	–	26.2	–
200	3.86	–	42	–	39	–	39	–	36	–	37	–	34	–	23.5	–

* EN 50288-2-2(2004)/IEC 61156-6(2002)

Chemical characteristics:
Free of hazardous substances acc. to RoHS 2002/95/EG

Certificates and Approvals:
Link-Performance: MegaLineNet® systems and further commercial cabling systems
Inspection certificate: acc. to DIN 55350-18-4.2.1 respectively EN 10204
In agreement to LVD (73/23/EEC): CE

Thermal characteristics:
Temperature range for fixed installation
-20°C up to +60°C
Temperature range for mobile operation
0°C up to +50°C

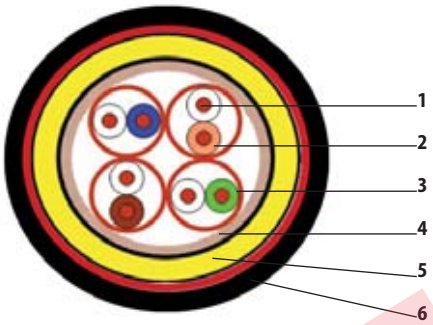
Article Number	Size	Overall diameter mm	Weight kg/km	Copper content kg/km	Colour sheath
7KS50008	4P	5.3 (approx.)	32 (approx.)	21	grey, RAL 7035
7KS50009	4P	5.3 (approx.)	32 (approx.)	21	yellow, RAL 1021
7KS50010	4P	5.3 (approx.)	32 (approx.)	21	green, RAL 6016
7KS50011	4P	5.3 (approx.)	32 (approx.)	21	blue, RAL 5015
7KS50012	4P	5.3 (approx.)	32 (approx.)	21	red, RAL 3000

Package: Drum 1,000 m

MegaLine® F10-130 S/F (L)2Y

$S_0 P_4 I_4 C_5 E_5$ Type: KS-02YSCH(L)2Y 4x2xAWG 22/1 PIMF

Category: "7_A"



Industry

Printing inner sheath:
LEONI MegaLine F10-130 S/F 4P H
SPACE Code 34455
"VDE approval mark" "Production lot code"
"Meter marking"

Printing outer sheath:
LEONI MegaLine F10-130 S/F 4P H(L)2Y
SPICE Code 04455
"Meter marking"

Colour code: wh/bu, wh/or, wh/gn, wh/bn
Colour inner sheath: yellow, RAL 1021
Colour outer sheath: black, RAL 9005

Fire behaviour:
Halogen acid gas emission: acc. to IEC 60754-2
Smoke density: acc. to IEC 61034
Calorific value (MJ/m): 3.04 (approx.)

Performance:
better than category 7 acc. EN 50288 and IEC 61156
excellent NEXT, low attenuation, excellent screening characteristics (individual and overall screen),
low SKEW
Bandwidth 1,300 MHz

Applications:
Installation cable for generic cabling systems acc. ISO/IEC 11801 and EN 50173 (2. edition) as well as ISO/IEC 24702 and EN 50173-3. Ideal for all applications of classes D up to F_A up to 10 GbE acc. IEEE 802.3 an, Cable sharing, VoIP, PoE. For outdoor and underground installation.

Mechanical characteristics:
Bending radius:
during installation: 8 x overall diameter (min.)
after installation: 4 x overall diameter (min.)
Tensile strength: 130 (max.)
Crush (N/100 mm): 2000
Impact (number of shocks): 20

Electromagnetic behaviour:
Transfer impedance at 10 MHz (mOhm/m): 5 (nominal value)
Screening attenuation up to 1,000 MHz (dB): 70 (nominal value)
Coupling attenuation up to 1,000 MHz (dB): 85 (nominal value)

Construction:

1	Conductor:	bare copper wire, AWG 22/1
2	Insulation:	cellular-PE, core-Ø: nominal value 1.6 mm
	Twisting element:	Pair
3	Individual screen:	aluminium-bonded polyester tape
	Twisting:	4 pairs
4	Overall screen:	tinned copper wire braid
5	Inner sheath:	halogen-free, flame retardant compound
6	Outer sheath:	AL-PE

	1	2	3	4	5
S	IEC 60332-2-2	IEC-60332-1-2	IEC-60332-3-24	EFP Grade 1	EFP Grade 2

Security (Fire behaviour)

	1	2	3	4	5
P	> Class E > 250 MHz	> Class E_A > 500 MHz	> Class F > 600 MHz	> Class F_A > 1,000 MHz	> Class „G" > 1,200 MHz

Performance (Cabling class, bandwidth)

	1	2	3	4	5
I	> 100 MbE	> 1 GbE	bis 10 GbE	> 10 GbE	> 10 GbE TV

Industrial Application (Ethernet, TV)

	1	2	3	4	5
C	AWG 27	AWG 26/25	AWG 24	AWG 23	AWG 22

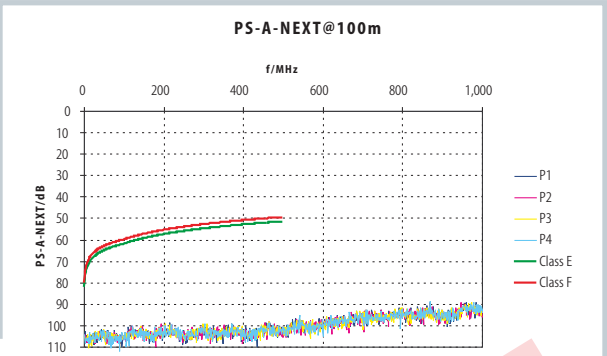
Construction (Conductor size, Tensile strength)

	1	2	3	4	5
E	> 40 dB	> 50 dB	> 60 dB	> 70 dB	> 80 dB

EMC (Coupling attenuation)

Electrical characteristics at 20°C:

DC resistance (Ohm/km):	57.1 (max.)
Insulation resistance (Gohm x km):	5 (min.)
Mutual capacitance (pF/m):	40 (approx.)
Transfer capacitance (e) (pF/km):	1,500 (approx.)
Signal velocity (c):	0.80 (approx.)
Propagation delay (ns/100m):	420 (approx.)
Skew at 100 MHz (ns/100m):	5 (approx.)
Characteristic impedance at 100 MHz (Ohm):	100 ± 5
Test voltage Ueff (V):	1,000
Operating voltage Ueff (V):	125 (max.)



Frequency MHz	Attenuation dB/100m		NEXT dB		PS-NEXT dB		ACR dB@100m		PS-ACR dB@100m		EL-FEXT dB@100m		PS-ELFEXT dB@100m		RL dB	
	typ.	Cat. 7 max.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*
1	1.7	2	105	80	102	77	104	78	101	75	105	80	102	77	27.1	23
10	4.5	5.7	105	80	102	77	101	74	98	71	108	74	105	71	35.2	25
100	15.4	18.5	105	72	102	69	90	54	87	51	93	54	90	51	38.9	20.1
200	22.9	26.8	105	68	102	65	83	41	80	38	85	48	82	45	36.6	18
250	26	30.2	105	66	102	63	79	36	76	33	82	46	79	43	35.3	17.3
500	35.9	44.1	100	62	97	59	64	18	61	15	70	40	67	37	29.4	17.3
600	40.4	48.9	95	61	92	58	55	12	52	9	63	38	60	35	26.6	17.3
700	44.6	-	95	–	92	–	50	–	47	–	60	–	57	–	25.8	–
800	47.7	–	93	–	90	–	45	–	42	–	57	–	54	–	25	–
900	51.6	–	90	–	87	–	38	–	35	–	53	–	50	–	23.6	–
1,000	54.8	–	88	–	85	–	33	–	30	–	48	–	45	–	22.3	–
1,100	56.9	–	87	–	84	–	30	–	27	–	44	–	41	–	21.4	–
1,300	61.4	–	80	–	77	–	21	–	18	–	39	–	36	–	18.3	–

* EN 50288-4-1(2004)/IEC 61156-5(2002)

Chemical characteristics:
Free of hazardous substances acc. to RoHS 2002/95/EG

Certificates and Approvals:
Quality mark with production control: VDE
Link-Performance: MegaLineNet® systems and further commercial cabling systems
Inspection certificate: acc. to DIN 55350-18-4.2.1 respectively EN 10204
In agreement to LVD (73/23/EEC): CE

Thermal characteristics:
Temperature range for fixed installation
-25°C up to +70°C
Temperature range for mobile operation
-10°C up to +50°C

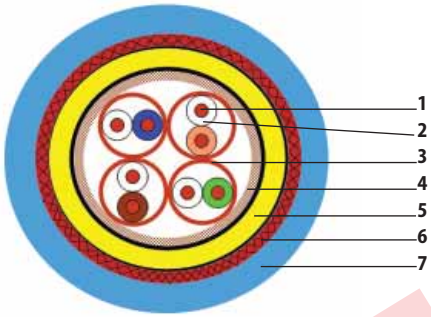
Article Number	Size	Overall diameter mm	Weight kg/km	Copper content kg/km	Colour sheath
7KS7002U	4P	12 (approx.)	150 (approx.)	48	black, RAL 9005

Package: Drum 1,000 m

MegaLine® F10-130 S/F QH

$S_3 P_4 I_4 C_5 E_5$ Type: KS-02YSCHQH 4x2xAWG 22/1 PIMF

Category: "7_A"



Industry

Printing inner sheath:
LEONI MegaLine F10-130 S/F 4P H
SPACE Code 34455
"VDE approval mark" "Production lot code"
"Meter marking"

Printing outer sheath:
LEONI MegaLine F10-130 S/F 4P HQH
SPICE Code 34455
"Production lot code" "Meter marking"

Colour code: wh/bu, wh/or, wh/gn, wh/bn
Printing inner sheath: yellow, RAL 1021
Colour outer sheath: blue, RAL 5015

Construction:

1	Conductor:	bare copper wire, AWG 22/1
2	Insulation:	cellular-PE, core-Ø: nominal value 1.6 mm
	Twisting element:	Pair
3	Individual screen:	aluminium-bonded polyester tape
	Twisting:	4 pairs
4	Overall screen:	tinned copper wire braid
5	Inner sheath:	halogen-free, flame retardant compound
6	Armour:	galvanized steel wire braid
7	Outer sheath:	halogen-free, flame retardant compound

Fire behaviour:
Flame retardance: acc. to IEC 60332-3-24
Halogen acid gas emission: acc. to IEC 60754-2
Smoke density: acc. to IEC 61034
Calorific value (MJ/m): 1.53 (approx.)

	1	2	3	4	5
S	IEC 60332-2-2	IEC-60332-1-2	IEC-60332-3-24	EFP Grade 1	EFP Grade 2

Security (Fire behaviour)

Performance:
better than category 7 acc. EN 50288 and IEC 61156 excellent NEXT, low attenuation, excellent screening characteristics (individual and overall screen), low SKEW
Bandwidth 1,200 MHz

	1	2	3	4	5
P	> Class E > 250 MHz	> Class E_A > 500 MHz	> Class F > 600 MHz	> Class F_A > 1,000 MHz	> Class „G" > 1,200 MHz

Performance (Cabling class, bandwidth)

Applications:
Installation cable for generic cabling systems acc. ISO/IEC 11801 and EN 50173 (2. edition) as well as ISO/IEC 24702 and EN 50173-3. Ideal for all applications of classes D up to E_A up to 10 GbE acc. IEEE 802.3 an, Cable sharing, VoIP, PoE. For indoor and outdoor installation (with reservation).

	1	2	3	4	5
I	> 100 MbE	> 1 GbE	bis 10 GbE	> 10 GbE	> 10 GbE TV

Industrial Application (Ethernet, TV)

Mechanical characteristics:
Bending radius:
during installation: 8 x overall diameter (min.)
after installation: 4 x overall diameter (min.)
Tensile strength: 1.400 (max.)
Crush (N/100 mm): 3,000
Impact (number of shocks): 50

	1	2	3	4	5
C	AWG 27	AWG 26/25	AWG 24	AWG 23	AWG 22

Construction (Conductor size, Tensile strength)

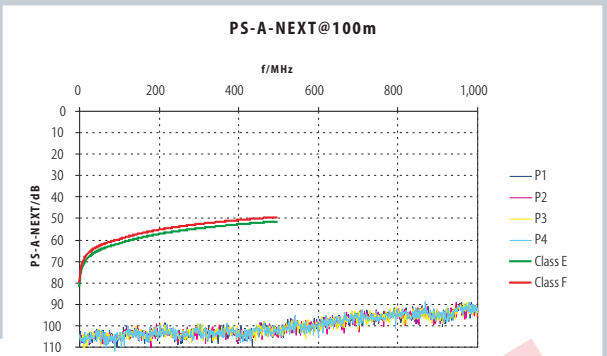
Electromagnetic behaviour:
Transfer impedance at 10 MHz (mOhm/m): 5 (nominal value)
Screening attenuation up to 1,000 MHz (dB): 70 (nominal value)
Coupling attenuation up to 1,000 MHz (dB): 85 (nominal value)

	1	2	3	4	5
E	> 40 dB	> 50 dB	> 60 dB	> 70 dB	> 80 dB

EMC (Coupling attenuation)

Electrical characteristics at 20°C:

DC resistance (Ohm/km):	57.1 (max.)
Insulation resistance (Gohm x km):	5 (min.)
Mutual capacitance (pF/m):	40 (approx.)
Transfer capacitance (e) (pF/km):	1,500 (approx.)
Signal velocity (c):	0.80 (approx.)
Propagation delay (ns/100m):	420 (approx.)
Skew at 100 MHz (ns/100m):	5 (approx.)
Characteristic impedance at 100 MHz (Ohm):	100 ± 5
Test voltage Ueff (V):	1,000
Operating voltage Ueff (V):	125 (max.)



Frequency MHz	Attenuation dB/100m		NEXT dB		PS-NEXT dB		ACR dB@100m		PS-ACR dB@100m		EL-FEXT dB@100m		PS-ELFEXT dB@100m		RL dB	
	typ.	Cat. 7 max.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*
1	1.7	2	105	80	102	77	104	78	101	75	105	80	102	77	27.1	23
10	4.5	5.7	105	80	102	77	101	74	98	71	108	74	105	71	35.2	25
100	15.4	18.5	105	72	102	69	90	54	87	51	93	54	90	51	38.9	20.1
200	22.9	26.8	105	68	102	65	83	41	80	38	85	48	82	45	36.6	18
250	26	30.2	105	66	102	63	79	36	76	33	82	46	79	43	35.3	17.3
500	35.9	44.1	100	62	97	59	64	18	61	15	70	40	67	37	29.4	17.3
600	40.4	48.9	95	61	92	58	55	12	52	9	63	38	60	35	26.6	17.3
700	44.6	-	95	–	92	–	50	–	47	–	60	–	57	–	25.8	–
800	47.7	–	93	–	90	–	45	–	42	–	57	–	54	–	25	–
900	51.6	–	90	–	87	–	38	–	35	–	53	–	50	–	23.6	–
1,000	54.8	–	88	–	85	–	33	–	30	–	48	–	45	–	22.3	–
1,100	56.9	–	87	–	84	–	30	–	27	–	44	–	41	–	21.4	–
1,300	61.4	–	80	–	77	–	21	–	18	–	39	–	36	–	18.3	–

* EN 50288-4-1(2004)/IEC 61156-5(2002)

Chemical characteristics:
Free of hazardous substances acc. to RoHS 2002/95/EG

Certificates and Approvals:
Quality mark with production control: VDE
Link-Performance: MegaLineNet® systems and further commercial cabling systems
Inspection certificate: acc. to DIN 55350-18-4.2.1 respectively EN 10204
In agreement to LVD (73/23/EEC): CE

Thermal characteristics:
Temperature range for fixed installation
-20°C up to +60°C
Temperature range for mobile operation
0°C up to +50°C

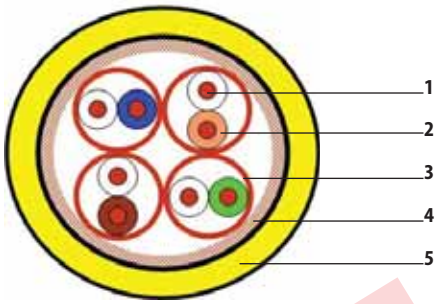
Article Number	Size	Overall diameter mm	Weight kg/km	Copper content kg/km	Colour sheath
7KS7001U	4P	11.7 (approx.)	185 (approx.)	48	blue, RAL 5015

Package: Drum 1,000 m

MegaLine® F10-130 S/F Vö

$S_3 P_4 I_4 C_5 E_5$ Type: KS-02YSCHVö 4x2xAWG 22/1 PIMF

Category: "7_A"



Industry

Printing outer sheath:
LEONI MegaLine F10-130 S/F 4P HVö
SPICE Code 34455
"VDE approval mark" "Production lot code"
"Meter marking"

Colour code: wh/bu, wh/or, wh/gn, wh/bn
Colour outer sheath: yellow, RAL 1021

Construction:

1	Conductor:	bare copper wire, AWG 22/1
2	Insulation:	cellular-PE, core-Ø: nominal value 1.6 mm
	Twisting element:	Pair
3	Individual screen:	aluminium-bonded polyester tape
	Twisting:	4 pairs
4	Overall screen:	tinned copper wire braid
5	Outer sheath:	halogen-free, flame retardant compound

Fire behaviour:
Flame retardance: acc. to IEC 60332-3-24
Halogen acid gas emission: acc. to IEC 60754-2
Smoke density: acc. to IEC 61034
Calorific value (MJ/m): 0.80 (approx.)

	1	2	3	4	5
S	IEC 60332-2-2	IEC-60332-1-2	IEC-60332-3-24	EFP Grade 1	EFP Grade 2

Security (Fire behaviour)

Performance:
better than category 7 acc. EN 50288 and IEC 61156 excellent NEXT, low attenuation, excellent screening characteristics (individual and overall screen), low SKEW
Bandwidth 1,300 MHz

	1	2	3	4	5
P	> Class E > 250 MHz	> Class E_A > 500 MHz	> Class F > 600 MHz	> Class F_A > 1,000 MHz	> Class „G" > 1,200 MHz

Performance (Cabling class, bandwidth)

Applications:
Installation cable for generic cabling systems acc. ISO/IEC 24702 and EN 501173-3. Ideal for all applications of classes D up to F_A up to 10 GbE acc. IEEE 802.3 an, cable sharing VoIP, PoE. For installation in harsh environment by particular robust H-sheath

	1	2	3	4	5
I	> 100 MbE	> 1 GbE	bis 10 GbE	> 10 GbE	> 10 GbE TV

Industrial Application (Ethernet, TV)

Mechanical characteristics:
Bending radius:
during installation: 8 x overall diameter (min.)
after installation: 4 x overall diameter (min.)
Tensile strength: 130 (max.)
Crush (N/100 mm): 1,000
Impact (number of shocks): 10

	1	2	3	4	5
C	AWG 27	AWG 26/25	AWG 24	AWG 23	AWG 22

Construction (Conductor size, Tensile strength)

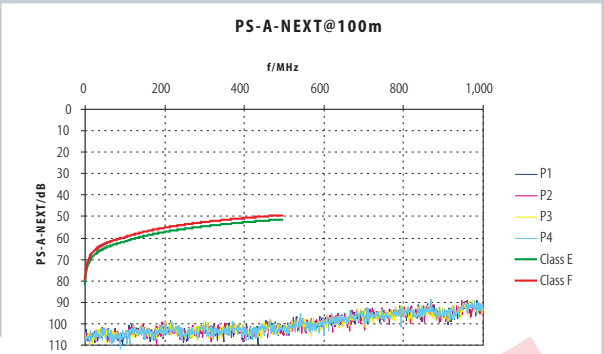
Electromagnetic behaviour:
Transfer impedance at 10 MHz (mOhm/m): 5 (nominal value)
Screening attenuation up to 1,000 MHz (dB): 70 (nominal value)
Coupling attenuation up to 1,000 MHz (dB): 85 (nominal value)

	1	2	3	4	5
E	> 40 dB	> 50 dB	> 60 dB	> 70 dB	> 80 dB

EMC (Coupling attenuation)

Electrical characteristics at 20°C:

DC resistance (Ohm/km):	57.1 (max.)
Insulation resistance (Gohm x km):	5 (min.)
Mutual capacitance (pF/m):	40 (approx.)
Transfer capacitance (e) (pF/km):	1,500 (approx.)
Signal velocity (c):	0.80 (approx.)
Propagation delay (ns/100m):	420 (approx.)
Skew at 100 MHz (ns/100m):	5 (approx.)
Characteristic impedance at 100 MHz (Ohm):	100 ± 5
Test voltage Ueff (V):	1,000
Operating voltage Ueff (V):	125 (max.)



Frequency MHz	Attenuation dB/100m		NEXT dB		PS-NEXT dB		ACR dB@100m		PS-ACR dB@100m		EL-FEXT dB@100m		PS-ELFEXT dB@100m		RL dB	
	typ.	Cat. 7 max.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*
1	1.7	2	105	80	102	77	104	78	101	75	105	80	102	77	27.1	23
10	4.5	5.7	105	80	102	77	101	74	98	71	108	74	105	71	35.2	25
100	15.4	18.5	105	72	102	69	90	54	87	51	93	54	90	51	38.9	20.1
200	22.9	26.8	105	68	102	65	83	41	80	38	85	48	82	45	36.6	18
250	26	30.2	105	66	102	63	79	36	76	33	82	46	79	43	35.3	17.3
500	35.9	44.1	100	62	97	59	64	18	61	15	70	40	67	37	29.4	17.3
600	40.4	48.9	95	61	92	58	55	12	52	9	63	38	60	35	26.6	17.3
700	44.6	-	95	–	92	–	50	–	47	–	60	–	57	–	25.8	–
800	47.7	–	93	–	90	–	45	–	42	–	57	–	54	–	25	–
900	51.6	–	90	–	87	–	38	–	35	–	53	–	50	–	23.6	–
1,000	54.8	–	88	–	85	–	33	–	30	–	48	–	45	–	22.3	–
1,100	56.9	–	87	–	84	–	30	–	27	–	44	–	41	–	21.4	–
1,300	61.4	–	80	–	77	–	21	–	18	–	39	–	36	–	18.3	–

* EN 50288-4-1(2004)/IEC 61156-5(2002)

Chemical characteristics:
Free of hazardous substances acc. to RoHS 2002/95/EG
Oil resistance acc. ICEA S-82-552 (60°C)

Certificates and Approvals:
Quality mark with production control: VDE
Link-Performance: MegaLineNet® systems and further commercial cabling systems
Inspection certificate: acc. to DIN 55350-18-4.2.1 respectively EN 10204
In agreement to LVD (73/23/EEC): CE

Thermal characteristics:
Temperature range for fixed installation
-20°C up to +60°C
Temperature range for mobile operation
0°C up to +50°C

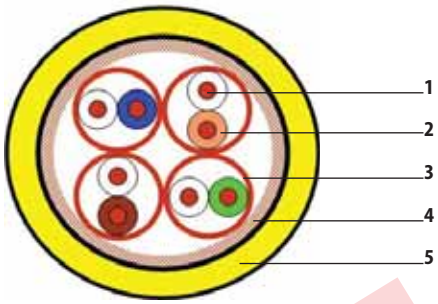
Article Number	Size	Overall diameter mm	Weight kg/km	Copper content kg/km	Colour sheath
7KS70089	4P	9.2 (approx.)	90 (approx.)	48	yellow, RAL 1021

Package: Drum 1,000 m

MegaLine® F10-115 S/F V

$S_3 P_4 I_4 C_4 E_5$ Type: KS-02YSCHV 4x2xAWG 23/1 PIMF

Category: "7_A"



Industry

Printing outer sheath:
LEONI MegaLine F10-115 S/F 4P HV
SPICE CODE 34445
"VDE approval mark" "Production lot code"
"Meter marking"

Colour code: wh/bu, wh/or, wh/gn, wh/bn
Colour outer sheath: yellow, RAL 1021

Construction:

1	Conductor:	bare copper wire, AWG 23/1
2	Insulation:	cellular-PE, core-Ø: nominal value 1.4 mm
	Twisting element:	Pair
3	Twisting:	4 pairs
4	Overall screen:	tinned copper wire braid
5	Outer sheath:	halogen-free, flame retardant compound thickness 1.0 mm

Fire behaviour:
Flame retardance: acc. to IEC 60332-3-24
Halogen acid gas emission: acc. to IEC 60754-2
Smoke density: acc. to IEC 61034
Calorific value (MJ/m): 0.7 (approx.)

S	1	2	3	4	5
	IEC 60332-2-2	IEC-60332-1-2	IEC-60332-3-24	EFP Grade 1	EFP Grade 2

Security (Fire behaviour)

Performance:
better than category 7 acc. EN 50288 and IEC 61156
excellent NEXT, excellent screening characteristics (individual and overall screen), low SKEW
Bandwidth 1,150 MHz

P	1	2	3	4	5
	> Class E > 250 MHz	> Class E_A > 500 MHz	> Class F > 600 MHz	> Class F_A > 1,000 MHz	> Class „G" > 1,200 MHz

Performance (Cabling class, bandwidth)

Applications:
Installation cable for generic cabling systems acc. ISO/IEC 24702 and EN 501173-3. Ideal for all applications of classes D up to F_A up to 10 GbE acc. IEEE 802.3 an, cable sharing VoIP, PoE. For installation in harsh environment by particular robust H-sheath

I	1	2	3	4	5
	> 100 MbE	> 1 GbE	bis 10 GbE	> 10 GbE	> 10 GbE TV

Industrial Application (Ethernet, TV)

Mechanical characteristics:
Bending radius:
during installation: 8 x overall diameter (min.)
after installation: 4 x overall diameter (min.)
Tensile strength: 110 (max.)
Crush (N/100 mm): 1,000
Impact (number of shocks): 10

C	1	2	3	4	5
	AWG 27	AWG 26/25	AWG 24	AWG 23	AWG 22

Construction (Conductor size, Tensile strength)

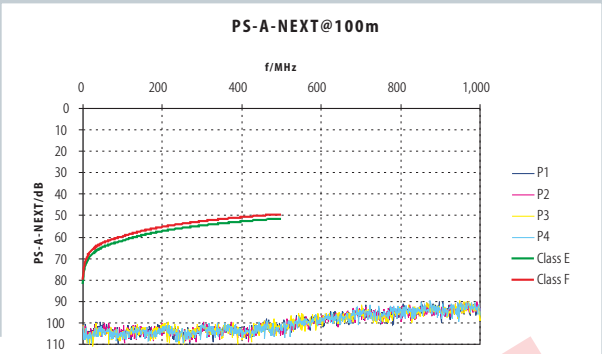
Electromagnetic behaviour:
Transfer impedance at 10 MHz (mOhm/m): 5 (nominal value)
Screening attenuation up to 1,000 MHz (dB): 70 (nominal value)
Coupling attenuation up to 1,000 MHz (dB): 85 (nominal value)

E	1	2	3	4	5
	> 40 dB	> 50 dB	> 60 dB	> 70 dB	> 80 dB

EMC (Coupling attenuation)

Electrical characteristics at 20°C:

DC resistance (Ohm/km):	75 (max.)
Insulation resistance (Gohm x km):	5 (min.)
Mutual capacitance (pF/m):	42 (approx.)
Transfer capacitance (e) (pF/km):	1,500 (approx.)
Signal velocity (c):	0.80 (approx.)
Propagation delay (ns/100m):	420 (approx.)
Skew at 100 MHz (ns/100m):	5 (approx.)
Characteristic impedance at 100 MHz (Ohm):	100 ± 5
Test voltage Ueff (V):	1,000
Operating voltage Ueff (V):	125 (max.)



Frequency MHz	Attenuation dB/100m		NEXT dB		PS-NEXT dB		ACR dB@100m		PS-ACR dB@100m		EL-FEXT dB@100m		PS-ELFEXT dB@100m		RL dB	
	typ.	Cat. 7 max.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*
1	1.9	2	105	80	102	77	104	78	101	75	98	80	95	77	26.6	23
10	4.8	5.7	105	80	102	77	101	74	98	71	103	74	100	71	35.2	25
100	16.3	18.5	105	72	102	69	89	54	86	51	89	54	86	51	39.6	20.1
200	24.3	26.8	105	68	102	65	81	41	78	38	82	48	79	45	36	18
250	27.5	30.2	105	66	102	63	78	36	75	33	79	46	76	43	34	17.3
500	37.9	44.1	100	62	97	59	62	18	59	15	67	40	64	37	29	17.3
600	42.4	48.9	95	61	92	58	53	12	50	9	60	38	57	35	25.4	17.3
700	47.2	-	95	–	92	–	48	–	45	–	57	–	54	–	24.6	–
800	50.3	–	93	–	90	–	43	-	40	–	53	–	50	–	23.5	–
900	54.6	–	90	–	87	–	35	–	32	–	49	–	46	–	22.6	–
1,000	58	–	88	–	85	–	30	–	27	–	44	–	41	–	21.5	–
1,150	61.9	–	86	–	83	–	25	–	22	–	39	–	36	–	20.6	–

* EN 50288-4-1(2004)/IEC 61156-5(2002)

Chemical characteristics:
Free of hazardous substances acc. to RoHS 2002/95/EG

Certificates and Approvals:
Quality mark with production control: VDE
Link-Performance: MegaLineNet® systems and further commercial cabling systems
Inspection certificate: acc. to DIN 55350-18-4.2.1 respectively EN 10204
In agreement to LVD (73/23/EEC): CE

Thermal characteristics:
Temperature range for fixed installation
-20°C up to +60°C
Temperature range for mobile operation
0°C up to +50°C

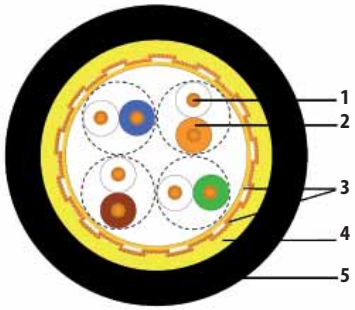
Article Number	Size	Overall diameter mm	Weight kg/km	Copper content kg/km	Colour sheath
7KS70049	4P	8.1 (approx.)	77 (approx.)	37	yellow, RAL 1021

Package: Drum 1,000 m

MegaLine® D1-20 SF/U 2Y

$S_0 P_0 I_1 C_3 E_3$ Type: KS-02YS(ST+C)H2Y 4x2xAWG 24/1

Category: 5



Industry

Printing inner sheath:
LEONI MegaLine D1-20 SF/U 4P H
SPACE Code 20133
"Production lot code" "Meter marking"

Printing outer sheath:
LEONI MegaLine D1-20 SF/U 4P H2Y
SPICE Code 00133
"Production lot code" "Meter marking"

Colour code: whbu/bu, whor/or, whgn/gn, whbn/bn
Colour inner sheath: yellow, RAL 1021
Colour outer sheath: black, RAL 9005

Construction:

1	Conductor:	bare copper wire, AWG 24/1
2	Insulation:	cellular-PE, core-Ø: nominal value 1.1 mm
	Twisting element:	Pair
	Twisting:	4 pairs
3	Overall screen:	aluminum-bonded polyester tape and tinned copper wire braid
4	Inner sheath:	halogen-free, flame retardant compound
5	Outer sheath:	PE

Fire behaviour:
Halogen acid gas emission: acc. to IEC 60754-2
Smoke density: acc. to IEC 61034
Calorific value (MJ/m): 1.88 (approx.)

	1	2	3	4	5
S	IEC 60332-2-2	IEC-60332-1-2	IEC-60332-3-24	EFP Grade 1	EFP Grade 2

Security (Fire behaviour)

Performance:
better than category 5 acc. EN 50288 and IEC 61156
very good screening characteristics
Bandwidth 200 MHz

	1	2	3	4	5
P	> Class E > 250 MHz	> Class E_A > 500 MHz	> Class F > 600 MHz	> Class F_A > 1,000 MHz	> Class „G" > 1,200 MHz

Performance (Cabling class, bandwidth)

Applications:
Installation cable for generic cabling systems acc. ISO/IEC 11801 and EN 50173 (2. edition) as well as ISO/IEC 24702 and EN 50173-3.
Ideal for all applications of class D up to 1 GbE acc. IEEE 802.3 ab, VoIP, PoE.
For outdoor and underground installation.

	1	2	3	4	5
I	> 100 MbE	> 1 GbE	bis 10 GbE	> 10 GbE	> 10 GbE TV

Industrial Application (Ethernet, TV)

Mechanical characteristics:
Bending radius:
during installation: 8 x overall diameter (min.)
after installation: 4 x overall diameter (min.)
Tensile strength: 85 (max.)
Crush (N/100 mm): 3,000
Impact (number of shocks): 50

	1	2	3	4	5
C	AWG 27	AWG 26/25	AWG 24	AWG 23	AWG 22

Construction (Conductor size, Tensile strength)

Electromagnetic behaviour:
Transfer impedance at 10 MHz (mOhm/m): 10 (nominal value)
Screening attenuation up to 1,000 MHz (dB): 55 (nominal value)
Coupling attenuation up to 1,000 MHz (dB): 70 (nominal value)

	1	2	3	4	5
E	> 40 dB	> 50 dB	> 60 dB	> 70 dB	> 80 dB

EMC (Coupling attenuation)

Electrical characteristics at 20°C:

DC resistance (Ohm/km):	95 (max.)
Insulation resistance (Gohm x km):	5 (min.)
Mutual capacitance (pF/m):	45 (approx.)
Transfer capacitance (e) (pF/km):	1,500 (approx.)
Signal velocity (c):	0.75 (approx.)
Propagation delay (ns/100m):	440 (approx.)
Skew at 100 MHz (ns/100m):	15 (approx.)
Characteristic impedance at 100 MHz (Ohm):	100 ± 5
Test voltage Ueff (V):	1,000
Operating voltage Ueff (V):	125 (max.)

Frequency MHz	Attenuation dB/100m		NEXT dB		PS-NEXT dB		ACR dB@100m		PS-ACR dB@100m		EL-FEXT dB@100m		PS-ELFEXT dB@100m		RL dB	
	typ.	Cat. 5 max.*	typ.	Cat. 5 min.*	typ.	Cat. 5 min.*	typ.	Cat. 5 min.*	typ.	Cat. 5 min.*	typ.	Cat. 5 min.*	typ.	Cat. 5 min.*	typ.	Cat. 5 min.*
1	2	2.1	75	65	72	62	73	63	70	60	89	64	86	61	24.8	-
4	3.1	4	69	56	66	53	66	52	63	49	84	52	81	49	28.6	23
10	5.1	6.3	62	50	59	47	57	44	54	41	76	44	73	41	33.3	25
16	7	8	58	47	55	44	51	39	48	36	70	40	67	37	34.3	25
31.25	9.7	11.4	53	43	50	40	44	31	41	28	63	34	60	31	33.9	23.6
62.5	13.2	16.5	49	38	46	35	36	22	33	19	58	28	55	25	31.3	21.5
100	17.6	21.3	45	35	42	32	28	14	25	11	52	24	49	21	27.7	20.1
155	22.3	-	42	–	39	–	20	–	17	–	49	–	46	–	24.7	–
200	26.5	–	40	–	37	–	14	–	11	–	45	–	42	–	22.4	–

* EN 50288-2-1(2004)/IEC 61156-5(2002)

Chemical characteristics:
Free of hazardous substances acc. to RoHS 2002/95/EG

Certificates and Approvals:
Link-Performance: MegaLineNet® systems and further commercial cabling systems
Inspection certificate: acc. to DIN 55350-18-4.2.1 respectively EN 10204
In agreement to LVD (73/23/EEC): CE

Thermal characteristics:
Temperature range for fixed installation
-25°C until +70°C
Temperature range for mobile operation
-10°C up to +50°C

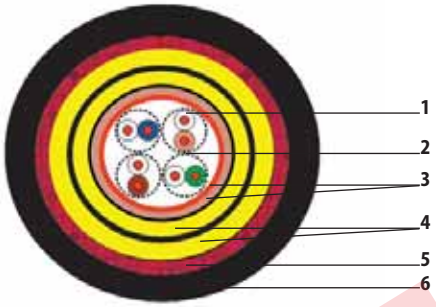
Article Number	Size	Overall diameter mm	Weight kg/km	Copper content kg/km	Colour sheath
7KS5001U	4P	8.8 (approx.)	70 (approx.)	26	black, RAL 9005

Package: Drum 1,000 m

MegaLine® D1-20 SF/U HQH

$S_2 P_0 I_1 C_3 E_3$ Type: KS-02YS(ST+C)HHQH 4x2xAWG 24/1

Category: 5



Industry

Printing inner sheath:
LEONI MegaLine D1-20 SF/U 4P H
SPACE Code 20133
"Production lot code" "Meter marking"

Printing outer sheath:
LEONI MegaLine D1-20 SF/U 4P HHQH
SPICE Code 20133
"Production lot code" "Meter marking"

Colour code: whbu/bu, whor/or, whgn/gn, whbn/bn
Colour inner sheath: yellow, RAL 1021
Colour outer sheath: black, RAL 9005

Construction:

1	Conductor:	bare copper wire, AWG 24/1
2	Insulation:	cellular-PE, core-Ø: nominal value 1,1 mm
	Twisting element:	Pair
	Twisting:	4 pairs
3	Overall screen:	aluminum-bonded polyester tape, tinned copper wire braid
4	Inner sheath:	2 layer halogen-free, flame retardant compound
5	Armour:	galvanized steel wire braid
6	Outer sheath:	halogen-free, flame retardant compound

Fire behaviour:
Flame retardance: acc. to IEC 60332-1-2
Halogen acid gas emission: acc. to IEC 60754-2
Smoke density: acc. to IEC 61034
Calorific value (MJ/m): 2.1 (approx.)

	1	2	3	4	5
S	IEC 60332-2-2	IEC-60332-1-2	IEC-60332-3-24	EFP Grade 1	EFP Grade 2

Security (Fire behaviour)

Performance:
better than category 5 acc. EN 50288 and IEC 61156
very good screening characteristics
Bandwidth 200 MHz

	1	2	3	4	5
P	> Class E > 250 MHz	> Class E_A > 500 MHz	> Class F > 600 MHz	> Class F_A > 1,000 MHz	> Class „G" > 1,200 MHz

Performance (Cabling class, bandwidth)

Applications:
Installation cable for generic cabling systems acc. ISO/IEC 11801 and EN 50173 (2. edition) as well as ISO/IEC 24702 and EN 50173-3. Ideal for all applications of class D up to 1 GbE acc. IEEE 802.3 ab, VoIP, PoE. For indoor and outdoor installation.

	1	2	3	4	5
I	> 100 MbE	> 1 GbE	bis 10 GbE	> 10 GbE	> 10 GbE TV

Industrial Application (Ethernet, TV)

Mechanical characteristics:
Bending radius:
during installation: 8 x overall diameter (min.)
after installation: 4 x overall diameter (min.)
Tensile strength: 1,200 (max.)
Crush (N/100 mm): 3,000
Impact (number of shocks): 50

	1	2	3	4	5
C	AWG 27	AWG 26/25	AWG 24	AWG 23	AWG 22

Construction (Conductor size, Tensile strength)

Electromagnetic behaviour:
Transfer impedance at 10 MHz (mOhm/m): 10 (nominal value)
Screening attenuation up to 1,000 MHz (dB): 55 (nominal value)
Coupling attenuation up to 1,000 MHz (dB): 70 (nominal value)

	1	2	3	4	5
E	> 40 dB	> 50 dB	> 60 dB	> 70 dB	> 80 dB

EMC (Coupling attenuation)

Electrical characteristics at 20°C:

DC resistance (Ohm/km):	95 (max.)
Insulation resistance (Gohm x km):	5 (min.)
Mutual capacitance (pF/m):	45 (approx.)
Transfer capacitance (e) (pF/km):	1,500 (approx.)
Signal velocity (c):	0.75 (approx.)
Propagation delay (ns/100m):	440 (approx.)
Skew at 100 MHz (ns/100m):	15 (approx.)
Characteristic impedance at 100 MHz (Ohm):	100 ± 5
Test voltage Ueff (V):	1,000
Operating voltage Ueff (V):	125 (max.)

Frequency MHz	Attenuation dB/100m		NEXT dB		PS-NEXT dB		ACR dB@100m		PS-ACR dB@100m		EL-FEXT dB@100m		PS-ELFEXT dB@100m		RL dB	
	typ.	Cat. 5 max.*	typ.	Cat. 5 min.*	typ.	Cat. 7 min.*	typ.	Cat. 5 min.*	typ.	Cat. 5 min.*	typ.	Cat. 5 min.*	typ.	Cat. 5 min.*	typ.	Cat. 5 min.*
1	2	2.1	75	65	72	62	73	63	70	60	89	64	86	61	24.8	-
4	3.1	4	69	56	66	53	66	52	63	49	84	52	81	49	28.6	23
10	5.1	6.3	62	50	59	47	57	44	54	41	76	44	73	41	33.3	25
16	7	8	58	47	55	44	51	39	48	36	70	40	67	37	34.3	25
31.25	9.7	11.4	53	43	50	40	44	31	41	28	63	34	60	31	33.9	23.6
62.5	13.2	16.5	49	38	46	35	36	22	33	19	58	28	55	25	31.3	21.5
100	17.6	21.3	45	35	42	32	28	14	25	11	52	24	49	21	27.7	20.1
155	22.3	-	42	–	39	–	20	–	17	–	49	–	46	–	24.7	–
200	26.5	–	40	–	37	–	14	–	11	–	45	–	42	–	22.4	–

* EN 50288-2-1(2004)/IEC 61156-5(2002

Chemical characteristics:
Free of hazardous substances acc. to RoHS 2002/95/EG

Certificates and Approvals:
Link-Performance: MegaLineNet® systems and further commercial cabling systems
Inspection certificate: acc. to DIN 55350-18-4.2.1 respectively EN 10204
In agreement to LVD (73/23/EEC): CE

Thermal characteristics:
Temperature range for fixed installation
-20°C up to +60°C
Temperature range for mobile operation
0°C up to +50°C

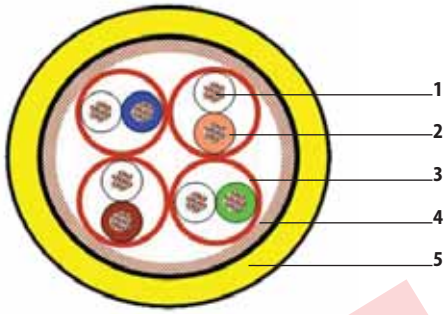
Article Number	Size	Overall diameter mm	Weight kg/km	Copper content kg/km	Colour sheath
7KS5002U	4P	11.9 (approx.)	194 (approx.)	26	black, RAL 9005

Package: Drum 1,000 m

MegaLine® F10-120 S/F 11Y flex

$S_1 P_4 I_5 C_2 E_5$ Type: KS-02YSC11Y 4x2xAWG 26/7 PIMF

Category: "7_A"



Industry

Printing outer sheath:
LEONI MegaLine F10-120 S/F flex 4P 11Y
SPICE Code 14525
"Production lot code" "Meter marking"

Colour code: wh/bu, wh/or, wh/gn, wh/bn
Colour outer sheath: yellow, RAL 1021

Construction:

1	Conductor:	bare stranded copper wire, AWG 26/7
2	Insulation:	cellular-PE, core-Ø: nominal value 1.0 mm
	Twisting element:	Pair
3	Individual screen:	aluminium-bonded polyester tape
	Twisting:	4 pairs
4	Overall screen:	tinned copper wire braid
5	Outer sheath:	PUR

Fire behaviour:
Flame retardance: acc. to IEC 60332-2-2
Halogen acid gas emission: acc. to IEC 60754-1/2
Smoke density: acc. to IEC 61043-1/2
Calorific value (MJ/m): 0.7 (approx.)

	1	2	3	4	5
S	IEC 60332-2-2	IEC-60332-1-2	IEC-60332-3-24	EFP Grade 1	EFP Grade 2

Security (Fire behaviour)

Performance:
better than category 7 acc. EN 50288 and IEC 61156
excellent NEXT, low attenuation, excellent screening characteristics (individual and overall screen),
low SKEW
Bandwidth 1,200 MHz

	1	2	3	4	5
P	> Class E > 250 MHz	> Class E_A > 500 MHz	> Class F > 600 MHz	> Class F_A > 1,000 MHz	> Class „G" > 1,200 MHz

Performance (Cabling class, bandwidth)

Applications:
Connecting cable and patch cord for generic cabling systems acc. ISO/IEC 11801 and EN 50173 (2. edition) as well as up to ISO/IEC 24702 and EN 50173-3. Ideal for all applications of classes D up to F_A Multimedia (Video, Data, Voice) up to 10 GbE acc. IEEE 802.3 an, Cable sharing, VoIP, PoE.
For installation in harsh environment by particular robust PUR-sheath.

	1	2	3	4	5
I	> 100 MbE	> 1 GbE	bis 10 GbE	> 10 GbE	> 10 GbE TV

Industrial Application (Ethernet, TV)

Mechanical characteristics:
Bending radius:
during operation: min. 5 x overall diameter
Tensile strength: 60 (max.)

	1	2	3	4	5
C	AWG 27	AWG 26/25	AWG 24	AWG 23	AWG 22

Construction (Conductor size, Tensile strength)

Electromagnetic behaviour:
Transfer impedance at 10 MHz (mOhm/m): 5 (nominal value)
Screening attenuation up to 1,000 MHz (dB): 60 (nominal value)
Coupling attenuation up to 1,000 MHz (dB): 85 (nominal value)

	1	2	3	4	5
E	> 40 dB	> 50 dB	> 60 dB	> 70 dB	> 80 dB

EMC (Coupling attenuation)

Electrical characteristics at 20°C:

DC resistance (Ohm/km):	150 (max.)
Insulation resistance (Gohm x km):	5 (min.)
Mutual capacitance (pF/m):	42 (approx.)
Signal velocity (c):	0.72 (approx.)
Propagation delay (ns/100m):	460 (approx.)
Skew at 100 MHz (ns/100m):	2.5 (approx.)
Characteristic impedance at 100 MHz (Ohm):	100 ± 5
Test voltage Ueff (V):	1,000
Operating voltage Ueff (V):	125 (max.)

Frequency MHz	Attenuation dB/10m		NEXT dB		PS-NEXT dB		ACR dB@10m		PS-ACR dB@10m		EL-FEXT dB@10m		PS-ELFEXT dB@10m		RL dB	
	typ.	Cat. 7 max.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*
1	0.25	0.29	100	80	97	77	100	80	97	77	100	80	97	80	24	23
10	0.76	0.85	99	80	96	77	99	79	96	77	95	74	92	71	33.9	25
100	2.49	2.78	95	72	92	69	93	70	90	69	69	54	66	51	38.3	20.1
200	3.69	4.01	92	68	89	65	88	64	85	65	65	48	62	45	35.3	18
250	4.18	4.53	90	66	87	63	86	62	83	63	62	46	59	43	32.9	17.3
500	5.6	6.62	83	62	80	59	78	55	75	59	54	40	51	37	29.7	17.3
600	6.74	7.33	81	61	78	58	74	53	71	58	50	38	47	35	30.6	17.3
700	7.32	–	80	–	77	–	72	–	69	–	50	–	47	–	31	–
800	7.89	–	77	–	74	–	69	–	66	–	50	–	47	–	26.7	–
900	8.5	–	75	–	72	–	67	–	64	–	34	–	31	–	28.6	–
1,000	9.11	–	74	–	71	–	65	–	62	–	32	–	29	–	27.5	–
1,100	9.5	–	72	–	69	–	63	–	60	–	28	–	25	–	26.9	–
1,200	9.9	–	70	–	67	–	61	–	58	–	24	–	21	–	26.3	–

* EN 50288-4-2(2004)/IEC 61156-6(2002)

Chemical characteristics:

Free of hazardous substances acc. to RoHS 2002/95/EG
Oil resistance acc. EN 60811-2-1
Resitance against microbes acc. to DIN VDE 0282
Resistance to chemicals
Hydrolytic resistance acc. to DIN 53504
Free of silicone oil that could influence paint-spraying

Thermal characteristics:

Temperature range for fixed installation
-20°C up to +60°C
Temperature range for mobile operation
0°C up to +50°C

Certificates and Approvals:

Link-Performance: MegaLineNet® systems and further commercial cabling systems
Inspection certificate: acc. to DIN 55350-18-4.2.1 respectively EN 10204
In agreement to LVD (73/23/EEC): CE

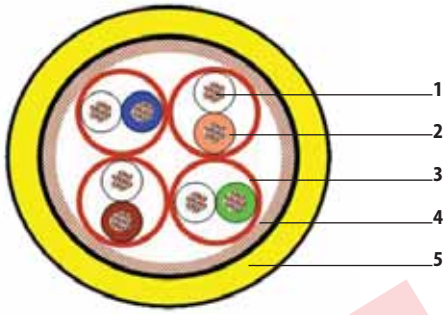
Article Number	Size	Overall diameter mm	Weight kg/km	Copper content kg/km	Colour sheath
7KS70090	4P	6.6 (approx.)	46 (approx.)	23.5	yellow, RAL 1021

Package: Drum 1,000 m

MegaLine® E5-70 S/F 11Y flex

$S_1 P_2 I_3 C_1 E_4$ Type: KS-02YSC11Y 4x2xAWG 27/7 PIMF

Category: "6_A"



Industry

Printing outer sheath:
LEONI MegaLine E5-70 S/F flex 4P 11Y
SPICE Code 12314
"Production lot code" "Meter marking"

Colour code: wh/bu, wh/or, wh/gn, wh/bn
Colour outer sheath: yellow, RAL 1021

Construction:

1	Conductor:	bare stranded copper wire, AWG 27/7
2	Insulation:	cellular-PE, core-Ø: nominal value 1.0 mm
	Twisting element:	Pair
3	Individual screen:	aluminium-bonded polyester tape
	Twisting:	4 pairs
4	Overall screen:	tinned copper wire braid
5	Outer sheath:	PUR

Fire behaviour:
Flame retardance: acc. to IEC 60332-2-2
Halogen acid gas emission: acc. to IEC 60754-2
Smoke density: acc. to IEC 61034
Calorific value (MJ/m): 0.46 (approx.)

	1	2	3	4	5
S	IEC 60332-2-2	IEC-60332-1-2	IEC-60332-3-24	EFP Grade 1	EFP Grade 2

Security (Fire behaviour)

Performance:
better than category 6 acc. EN 50288 and IEC 61156
very good NEXT, very good screening characteristics (individual and overall screen), low SKEW
Bandwidth 700 MHz

	1	2	3	4	5
P	> Class E > 250 MHz	> Class E_A > 500 MHz	> Class F > 600 MHz	> Class F_A > 1,000 MHz	> Class „G" > 1,200 MHz

Performance (Cabling class, bandwidth)

Applications:
Connecting cable and patch cord for generic cabling systems acc. ISO/IEC 11801 and EN 50173 (2. edition) as well as up to ISO/IEC 24702 and EN 50173-3. Ideal for all applications of classes D up to E_A Multimedia (Video, Data, Voice) up to 10 GbE acc. IEEE 802.3 an, Cable sharing, VoIP, PoE. For installation in harsh environment by particular robust PUR-sheath.

	1	2	3	4	5
I	> 100 MbE	> 1 GbE	bis 10 GbE	> 10 GbE	> 10 GbE TV

Industrial Application (Ethernet, TV)

Mechanical characteristics:
Bending radius:
during operation: min. 5 x overall diameter
Tensile strength: 40 (max.)

	1	2	3	4	5
C	AWG 27	AWG 26/25	AWG 24	AWG 23	AWG 22

Construction (Conductor size, Tensile strength)

Electromagnetic behaviour:
Transfer impedance at 10 MHz (mOhm/m): 5 (nominal value)
Screening attenuation up to 1,000 MHz (dB): 60 (nominal value)
Coupling attenuation up to 1,000 MHz (dB): 80 (nominal value)

	1	2	3	4	5
E	> 40 dB	> 50 dB	> 60 dB	> 70 dB	> 80 dB

EMC (Coupling attenuation)

Electrical characteristics at 20°C:

DC resistance (Ohm/km):	170 (max.)
Insulation resistance (Gohm x km):	5 (min.)
Mutual capacitance (pF/m):	44 (approx.)
Signal velocity (c):	0.78 (approx.)
Propagation delay (ns/100m):	430 (approx.)
Skew at 100 MHz (ns/100m):	2.5 (approx.)
Characteristic impedance at 100 MHz (Ohm):	100 ± 5
Test voltage Ueff (V):	1,000
Operating voltage Ueff (V):	125 (max.)

Frequency MHz	Attenuation dB/10m		NEXT dB		PS-NEXT dB		ACR dB@100m		PS-ACR dB@100m		EL-FEXT dB@100m		PS-ELFEXT dB@100m		RL dB	
	typ.	Cat. 6 max.*	typ.	Cat. 6 min.*	typ.	Cat. 6 min.*	typ.	Cat. 6 min.*	typ.	Cat. 6 min.*	typ.	Cat. 6 min.*	typ.	Cat. 6 min.*	typ.	Cat. 6 min.*
1	0.29	0.30	90	66	87	64	90	66	87	64	95	66	92	63	22.7	-
4	0.43	0.56	90	65	87	63	90	65	87	63	98	63	95	60	26.8	25
10	0.71	0.88	90	59	87	57	89	58	86	57	101	57	98	54	32.5	27.1
16	0.97	1.11	90	56	87	54	89	55	86	54	98	54	95	51	35.7	25.7
31.25	1.46	1.56	90	52	87	50	89	50	86	50	89	50	86	47	38.9	17.3
62.5	2	2.23	90	47	87	45	88	45	85	45	78	45	75	42	41	17.3
100	2.68	2.85	90	44	87	65	87	41	84	65	68	42	65	39	39.2	17.3
155	3.2	3.6	87	41	84	39	84	38	81	39	61	39	58	36	37.4	17.3
200	3.81	4.12	85	40	82	38	81	36	78	38	58	38	55	35	35.1	17.3
250	4.31	4.65	83	38	80	36	79	34	76	36	56	36	53	33	33.2	17.3
300	4.87	5.13	80	37	77	35	75	32	72	35	56	35	53	32	31.8	17.3
450	5.9	6.4	75	35	72	33	69	28	66	33	48	33	45	30	29.7	17.3
500	6.73	6.79	72	34	69	32	65	27	62	32	38	32	35	29	28.8	17.3
600	7.47	-	69	-	66	-	62	-	59	-	32	-	29	-	28.7	-
700	8.15	-	65	-	61	-	57	-	53	-	29	-	26	-	25.3	-

EN 50288-10-1 (draft)/EN 50288-5-2(2004)/IEC 61156-6(2002)

Chemical characteristics:

Free of hazardous substances acc. to RoHS 2002/95/EG
Oil resistance acc. EN 60811-2-1
Resitance against microbes acc. to DIN VDE 0282
Resistance to chemicals Hydrolytic resistance acc. to DIN 53504
Free of silicone oil that could influence paint-spraying

Thermal characteristics:

Temperature range for fixed installation
-20°C up to +60°C
Temperature range for mobile operation
0°C up to +50°C

Certificates and Approvals:

Link-Performance: MegaLineNet® systems and further commercial cabling systems
Inspection certificate: acc. to DIN 55350-18-4.2.1 respectively EN 10204
In agreement to LVD (73/23/EEC): CE

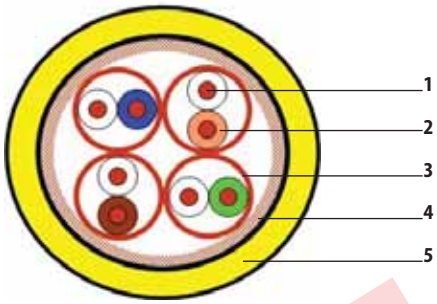
Article Number	Size	Overall diameter mm	Weight kg/km	Copper content kg/km	Colour sheath
7KS60048	4P	5.9 (approx.)	34 (approx.)	17	yellow, RAL 1021

Package: Drum 1,000 m

MegaLine® G12-150 S/F

$S_4 P_5 A_5 C_5 E_5$ Type: KS-02YSCH 4x2xAWG 22/1 PIMF

Category: "8"



Data Center

Printing outer sheath:
LEONI MegaLine G12-150 S/F 4P H
SPACE Code 45555
"VDE approval mark" "Production lot code"
"Meter marking"

Colour code: wh/bu, wh/or, wh/gn, wh/bn
Colour outer sheath: yellow, RAL 1021

Construction:

1	Conductor:	bare copper wire, AWG 22/1
2	Insulation:	cellular-PE, core-Ø: nominal value 1.6 mm
	Twisting element:	Pair
3	Individual screen:	aluminium-bonded polyester tape
	Twisting:	4 pairs
4	Overall screen:	tinned copper wire braid
5	Outer sheath:	halogen-free, flame retardant compound

Fire behaviour:
Flame retardance EFP Grade 1
Halogen acid gas emission: acc. to IEC 60754-2
Smoke density: acc. to IEC 61034
Calorific value (MJ/m): 0.83 (approx.)

	1	2	3	4	5
S	IEC 60332-2-2	IEC-60332-1-2	IEC-60332-3-24	EFP Grade 1	EFP Grade 2

Security (Fire behaviour)

Performance:
better than category 7 ("8") acc. EN 50288 and IEC 61156
excellent NEXT, very low attenuation, excellent screening characteristics (individual and overall screen),
low SKEW
Bandwidth 1,500 MHz

	1	2	3	4	5
P	> Class E > 250 MHz	> Class E_A > 500 MHz	> Class F > 600 MHz	> Class F_A > 1,000 MHz	> Class „G" > 1,200 MHz

Performance (Cabling class, bandwidth)

Applications:
Installation cable for generic cabling systems acc. ISO/IEC 11801 and EN 50173 (2. edition) and for Data Center acc. ISO/IEC 24764 and EN 50173-5.
Ideal for all applications of classes D up to F_A Multimedia (Video, Data, Voice) >10 GbE acc. IEEE 802.3 an,
Cable sharing, VoIP, PoE.

	1	2	3	4	5
A	> 100 MbE	> 1 GbE	bis 10 GbE	> 10 GbE	> 10 GbE TV

Application (Ethernet, TV)

Mechanical characteristics:
Bending radius:
during installation: 8 x overall diameter (min.)
after installation: 4 x overall diameter (min.)
Tensile strength: 130 (max.)
Crush (N/100 mm): 1,000
Impact (number of shocks): 10

	1	2	3	4	5
C	AWG 27	AWG 26/25	AWG 24	AWG 23	AWG 22

Construction (Conductor size, Tensile strength)

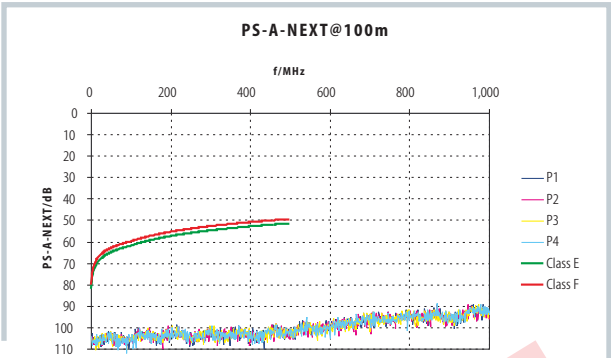
Electromagnetic behaviour:
Transfer impedance at 10 MHz (mOhm/m): 2 (nominal value)
Screening attenuation up to 1,000 MHz (dB): 80 (nominal value)
Coupling attenuation up to 1,000 MHz (dB): 90 (nominal value)

	1	2	3	4	5
E	> 40 dB	> 50 dB	> 60 dB	> 70 dB	> 80 dB

EMC (Coupling attenuation)

Electrical characteristics at 20°C:

DC resistance (Ohm/km):	57.1 (max.)
Insulation resistance (Gohm x km):	5 (min.)
Mutual capacitance (pF/m):	42 (approx.)
Transfer capacitance (e) (pF/km):	1,500 (approx.)
Signal velocity (c):	0.80 (approx.)
Propagation delay (ns/100m):	420 (approx.)
Skew at 100 MHz (ns/100m):	3 (approx.)
Characteristic impedance at 100 MHz (Ohm):	100 ± 5
Test voltage Ueff (V):	1,000
Operating voltage Ueff (V):	125 (max.)



Frequency MHz	Attenuation dB/100m		NEXT dB		PS-NEXT dB		ACR dB@100m		PS-ACR dB@100m		EL-FEXT dB@100m		PS-ELFEXT dB@100m		RL dB	
	typ.	Cat. 7 max.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*
1	1.6	2	110	80	107	77	108	78	105	75	109	80	106	77	26.1	23
10	4.2	5.7	110	80	107	77	106	74	103	71	109	74	106	71	32.3	25
100	14.4	18.5	110	72	107	69	96	54	93	51	93	54	90	51	36.2	20.1
200	21.5	26.8	110	68	107	65	88	41	85	38	86	48	83	45	35.5	18
250	24.5	30.2	105	66	102	63	81	36	78	33	83	46	80	43	34.8	17.3
500	34	44.1	105	62	102	59	71	18	68	15	70	40	67	37	31.8	17.3
600	37.7	48.9	100	61	97	58	62	12	59	9	64	38	61	35	28.5	17.3
800	44.5	–	95	–	92	–	50	–	47	–	58	–	55	–	25.3	–
900	48.1	–	95	–	92	–	47	–	44	–	54	–	51	–	23.8	–
1,000	49	–	92	–	89	–	43	–	40	–	49	–	46	–	22.2	–
1,200	54.9	–	88	–	85	–	34	–	31	–	40	–	37	–	20.2	–
1,300	57	–	81	–	78	–	24	–	21	–	35	–	32	–	18.3	–
1,400	58.1	–	74	–	71	–	16	–	13	–	30	–	27	–	16.3	–
1,500	62	–	73	–	70	–	11	–	8	–	25	–	22	–	12.3	–

* EN 50288-4-1(2004)/IEC 61156-5(2002)

Chemical characteristics:
Free of hazardous substances acc. to RoHS 2002/95/EG

Certificates and Approvals:
Quality mark with production control: VDE
Link-Performance: MegaLineNet® systems and further commercial cabling systems
Inspection certificate: acc. to DIN 55350-18-4.2.1 respectively EN 10204
In agreement to LVD (73/23/EEC): CE

Thermal characteristics:
Temperature range for fixed installation
-20°C up to +60°C
Temperature range for mobile operation
0°C up to +50°C

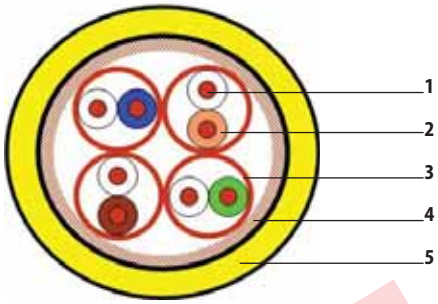
Article Number	Size	Overall diameter mm	Weight kg/km	Copper content kg/km	Colour sheath
7KS80002	4P	8.8 (approx.)	99 (approx.)	56	yellow, RAL 1021

Package: Drum 1,000 m

MegaLine® F10-130 S/F

$S_4 P_4 A_4 C_5 E_5$ Type: KS-02YSCH 4x2xAWG 22/1 PIMF

Category: "7_A "



Data Center

Printing outer sheath:
LEONI MegaLine F10-130 S/F 4P H
SPACE Code 44455
"VDE approval mark" "Production lot code"
"Meter marking"

Colour code: wh/bu, wh/or, wh/gn, wh/bn
Colour outer sheath: yellow, RAL 1021

Construction:

1	Conductor:	bare copper wire, AWG 22/1
2	Insulation:	cellular-PE, core-Ø: nominal value 1.6 mm
	Twisting element:	Pair
3	Individual screen:	aluminium-bonded polyester tape
	Twisting:	4 pairs
4	Overall screen:	tinned copper wire braid
5	Outer sheath:	halogen-free, flame retardant compound

Fire behaviour:
Flame retardance: EFP Grade 1
Halogen acid gas emission: acc. to IEC 60754-2
Smoke density: acc. to IEC 61034
Calorific value (MJ/m): 0.83 (approx.)

	1	2	3	4	5
S	IEC 60332-2-2	IEC-60332-1-2	IEC-60332-3-24	EFP Grade 1	EFP Grade 2

Security (Fire behaviour)

Performance:
better than category 7 acc. EN 50288 and IEC 61156
excellent NEXT, low attenuation, excellent screening characteristics (individual and overall screen),
low SKEW
Bandwidth 1,300 MHz

	1	2	3	4	5
P	> Class E > 250 MHz	> Class E_A > 500 MHz	> Class F > 600 MHz	> Class F_A > 1,000 MHz	> Class „G" > 1,200 MHz

Performance (Cabling class, bandwidth)

Applications:
Installation cable for generic cabling systems acc. ISO/IEC 11801 and EN 50173 (2. edition) and for Data Center acc. ISO/IEC 24764 and EN 50173-5.
Ideal for all applications of classes D up to F_A Multimedia (Video, Data, Voice) >10 GbE acc. IEEE 802.3 an,
Cable sharing, VoIP, PoE

	1	2	3	4	5
A	> 100 MbE	> 1 GbE	bis 10 GbE	> 10 GbE	> 10 GbE TV

Application (Ethernet, TV)

Mechanical characteristics:
Bending radius:
during installation: 8 x overall diameter (min.)
after installation: 4 x overall diameter (min.)
Tensile strength: 130 (max.)
Crush (N/100 mm): 1,000
Impact (number of shocks): 10

	1	2	3	4	5
C	AWG 27	AWG 26/25	AWG 24	AWG 23	AWG 22

Construction (Conductor size, Tensile strength)

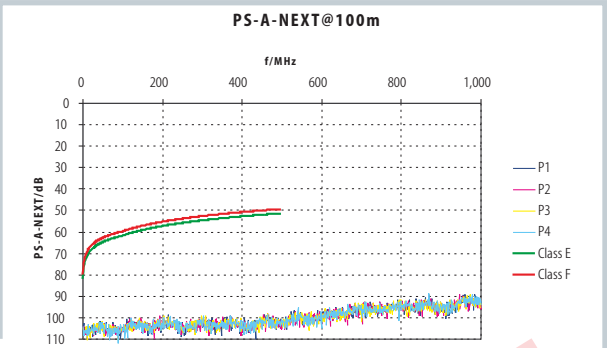
Electromagnetic behaviour:
Transfer impedance at 10 MHz (mOhm/m): 5 (nominal value)
Screening attenuation up to 1,000 MHz (dB): 70 (nominal value)
Coupling attenuation up to 1,000 MHz (dB): 85 (nominal value)

	1	2	3	4	5
E	> 40 dB	> 50 dB	> 60 dB	> 70 dB	> 80 dB

EMC (Coupling attenuation)

Electrical characteristics at 20°C:

DC resistance (Ohm/km):	57.1 (max.)
Insulation resistance (Gohm x km):	5 (min.)
Mutual capacitance (pF/m):	40 (approx.)
Transfer capacitance (e) (pF/km):	1,500 (approx.)
Signal velocity (c):	0.80 (approx.)
Propagation delay (ns/100m):	420 (approx.)
Skew at 100 MHz (ns/100m):	5 (approx.)
Characteristic impedance at 100 MHz (Ohm):	100 ± 5
Test voltage Ueff (V):	1,000
Operating voltage Ueff (V):	125 (max.)



Frequency MHz	Attenuation dB/100m		NEXT dB		PS-NEXT dB		ACR dB@100m		PS-ACR dB@100m		EL-FEXT dB@100m		PS-ELFEXT dB@100m		RL dB	
	typ.	Cat. 7 max.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*
1	1.7	2	105	80	102	77	104	78	101	75	105	80	102	77	27.1	23
10	4.5	5.7	105	80	102	77	101	74	98	71	108	74	105	71	35.2	25
100	15.4	18.5	105	72	102	69	90	54	87	51	93	54	90	51	38.9	20.1
200	22.9	26.8	105	68	102	65	83	41	80	38	85	48	82	45	36.6	18
250	26	30.2	105	66	102	63	79	36	76	33	82	46	79	43	35.3	17.3
500	35.9	44.1	100	62	97	59	64	18	61	15	70	40	67	37	29.4	17.3
600	40.4	48.9	95	61	92	58	53	12	52	9	63	38	60	35	26.6	17.3
700	44.6	–	95	–	92	–	50	–	47	–	60	–	57	–	25.8	–
800	47.7	–	93	–	90	–	45	–	42	–	57	–	54	–	25	–
900	51.6	–	90	–	87	–	38	–	35	–	53	–	50	–	23.6	–
1,000	54.8	–	88	–	85	–	33	–	30	–	48	–	45	–	22.3	–
1,100	56.9	–	87	–	84	–	30	–	27	–	44	–	41	–	21.4	–
1,300	61.4	–	80	–	77	–	21	–	18	–	39	–	36	–	18.3	–

* EN 50288-4-1(2004)/IEC 61156-5(2002)

Chemical characteristics:
Free of hazardous substances acc. to RoHS 2002/95/EG

Certificates and Approvals:
Quality mark with production control: VDE
Link-Performance: MegaLineNet® systems and further commercial cabling systems
Inspection certificate: acc. to DIN 55350-18-4.2.1 respectively EN 10204
In agreement to LVD (73/23/EEC): CE

Thermal characteristics:
Temperature range for fixed installation
-20°C up to +60°C
Temperature range for mobile operation
0°C up to +50°C

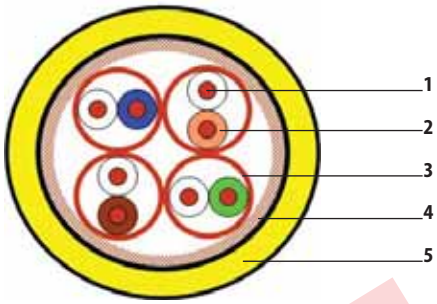
Article Number	Size	Overall diameter mm	Weight kg/km	Copper content kg/km	Colour sheath
7KS70025	4P	8.8 (approx.)	97 (approx.)	56	yellow, RAL 1021

Package: Drum 1,000 m

MegaLine® F10-115 S/F

$S_4 P_4 A_4 C_4 E_5$ Type: KS-02YSCH 4x2xAWG 23/1 PIMF

Category: "7_A"



Data Center

Printing outer sheath:
LEONI MegaLine F10-115 S/F 4P H
SPACE CODE 44445
"VDE approval mark" "Production lot code"
"Meter marking"

Colour code: wh/bu, wh/or, wh/gn, wh/bn
Colour outer sheath: yellow, RAL 1021

Construction:

1	Conductor:	bare copper wire, AWG 23/1
2	Insulation:	cellular-PE, core-Ø: nominal value 1.4 mm
	Twisting element:	Pair
3	Individual screen:	aluminium-bonded polyester tape
	Twisting:	4 pairs
4	Overall screen:	tinned copper wire braid
5	Outer sheath:	halogen-free, flame retardant compound

Fire behaviour:
Flame retardance EFP Grade 1
Halogen acid gas emission: acc. to IEC 60754-2
Smoke density: acc. to IEC 61034
Calorific value (MJ/m): 0.71 (approx.)

	1	2	3	4	5
S	IEC 60332-2-2	IEC-60332-1-2	IEC-60332-3-24	EFP Grade 1	EFP Grade 2

Security (Fire behaviour)

Performance:
better than category 7 acc. EN 50288 and IEC 61156
excellent NEXT, excellent screening characteristics (individual and overall screen),
low SKEW
Bandwidth 1,150 MHz

	1	2	3	4	5
P	> Class E > 250 MHz	> Class E_A > 500 MHz	> Class F > 600 MHz	> Class F_A > 1,000 MHz	> Class „G" > 1,200 MHz

Performance (Cabling class, bandwidth)

Applications:
Installation cable for generic cabling systems acc. ISO/IEC 11801 and EN 50173 (2. edition) and for Data Center acc. ISO/IEC 24764 and EN 50173-5.
Ideal for all applications of classes D up to F_A Multimedia (Video, Data, Voice) >10 GbE acc. IEEE 802.3 an,
Cable sharing, VoIP, PoE

	1	2	3	4	5
A	> 100 MbE	> 1 GbE	bis 10 GbE	> 10 GbE	> 10 GbE TV

Application (Ethernet, TV)

Mechanical characteristics:
Bending radius:
during installation: 8 x overall diameter (min.)
after installation: 4 x overall diameter (min.)
Tensile strength: 110 (max.)
Crush (N/100 mm): 1,000
Impact (number of shocks): 10

	1	2	3	4	5
C	AWG 27	AWG 26/25	AWG 24	AWG 23	AWG 22

Construction (Conductor size, Tensile strength)

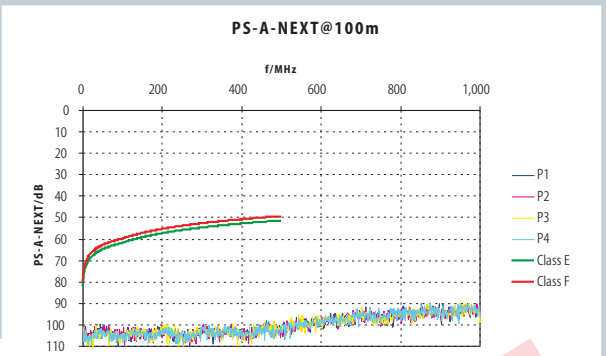
Electromagnetic behaviour:
Transfer impedance at 10 MHz (mOhm/m): 5 (nominal value)
Screening attenuation up to 1,000 MHz (dB): 70 (nominal value)
Coupling attenuation up to 1,000 MHz (dB): 85 (nominal value)

	1	2	3	4	5
E	> 40 dB	> 50 dB	> 60 dB	> 70 dB	> 80 dB

EMC (Coupling attenuation)

Electrical characteristics at 20°C:

DC resistance (Ohm/km):	75 (max.)
Insulation resistance (Gohm x km):	5 (min.)
Mutual capacitance (pF/m):	42 (approx.)
Transfer capacitance (e) (pF/km):	1,500 (approx.)
Signal velocity (c):	0.80 (approx.)
Propagation delay (ns/100m):	420 (approx.)
Skew at 100 MHz (ns/100m):	5 (approx.)
Characteristic impedance at 100 MHz (Ohm):	100 ± 5
Test voltage Ueff (V):	1,000
Operating voltage Ueff (V):	125 (max.)



Frequency MHz	Attenuation dB/100m		NEXT dB		PS-NEXT dB		ACR dB@100m		PS-ACR dB@100m		EL-FEXT dB@100m		PS-ELFEXT dB@100m		RL dB	
	typ.	Cat. 7 max.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*
1	1.9	2	105	80	102	77	104	78	101	75	98	80	95	77	26.6	23
10	4.8	5.7	105	80	102	77	101	74	98	71	103	74	100	71	35.3	25
100	16.3	18.5	105	72	102	69	89	54	86	51	89	54	86	51	39.6	20.1
200	24.3	26.8	105	68	102	65	81	41	78	38	82	48	79	45	36	18
250	27.5	30.2	105	66	102	63	78	36	75	33	79	46	76	43	34	17.3
500	37.9	44.1	100	62	97	59	62	18	59	15	67	40	64	37	29	17.3
600	42.4	48.9	95	61	92	58	53	12	50	9	60	38	57	35	25.4	17.3
700	47.2	–	95	–	92	–	48	–	45	–	57	–	54	–	24.6	–
800	50.3	–	93	–	90	–	43	–	40	–	53	–	50	–	23.5	–
900	54.6	–	90	–	87	–	35	–	32	–	49	–	46	–	22.6	–
1,000	58	–	88	–	85	–	30	–	27	–	44	–	41	–	21.5	–
1,150	61.9	–	86	–	83	–	25	–	22	–	39	–	36	–	20.6	–

* EN 50288-4-1(2004)/IEC 61156-5(2002)

Chemical characteristics:
Free of hazardous substances acc. to RoHS 2002/95/EG

Certificates and Approvals:
Quality mark with production control: ᴠ VDE ᴡ
Link-Performance: MegaLineNet® systems and further commercial cabling systems
Inspection certificate: acc. to DIN 55350-18-4.2.1 respectively EN 10204
In agreement to LVD (73/23/EEC): CE

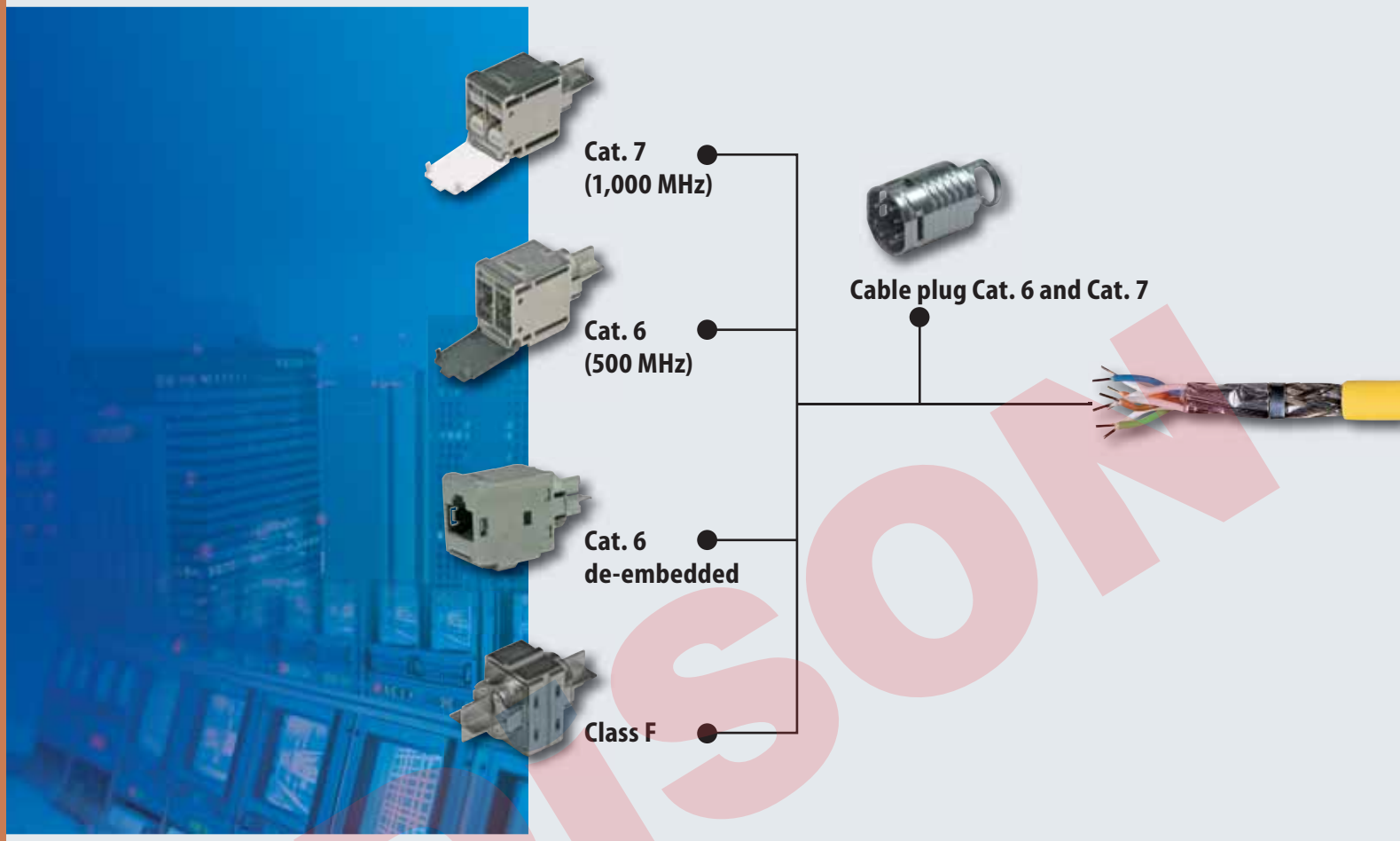
Thermal characteristics:
Temperature range for fixed installation
-20°C up to +60°C
Temperature range for mobile operation
0°C up to +50°C

Article Number	Size	Overall diameter mm	Weight kg/km	Copper content kg/km	Colour sheath
7KS70024	4P	7.8 (approx.)	84 (approx.)	44	yellow, RAL 1021

Package: Drum 1,000 m

VarioKeystone® –

the revolution in connection technology



With VarioKeystone®, LEONI Kerpen offers a superlative connecting concept. The system guarantees innovation and a secure future as well as maximum achievable quality and value retention for long periods. The modular design allows all previous and future demands made on in-house cablings to be met.

The modular design of the available jack modules RJ45 (IEC 60603-7-5) and 4K6 / 4K7 (IEC 61076-3-104) allows them to be replaced with relatively little effort. This makes it easy to decide on the right plug face.

The cable plug Cat. 6 is fitted to each end of the cable. In conjunction with the jack module RJ45 or 4K6, it allows a high-quality Class E channel to be built up. The cable plug Cat. 7 meets the demands of Class E in conjunction with the jack module RJ45 and those of Class F in conjunction with the jack module 4K7.

The “extender” allows Class F links to be extended easily.

VarioKeystone®

Cable plugs

Category 7

Description
The VarioKeystone® cable plug makes it possible to build up application-independent channels going far beyond the requirements of Class F and determine the plug face to the user without further installation effort, even some time afterwards.
The VarioKeystone® cable plug is crimped to the installation cable easily and rapidly, thus turning the interface into a modularly replaceable jack module.
Various different plug faces are available for the VarioKeystone® jack module.

Structure:	full metal; zinc die-cast, nickel-plated
Wiring:	4 pairs via punchdown method according to EIA/TIA 568A
Strain relief:	via cable clips
Shielding:	large-surface 360° shield connection Contact block: white
Electrical values:	Cat. 7
Standards:	ISO/IEC 11801:2002, EN 50173-1:2002

VarioKeystone® cable plug Cat. 7

Article no.	Name	Version
9A460054	VarioKeystone® cable plug (9.0 mm hole for AWG 23)	Cat. 7
9A460057	VarioKeystone® cable plug (10.0 mm hole for AWG 22)	Cat. 7

Category 6

Description
The VarioKeystone® cable plug makes it possible to build up application-independent channels and determine the plug face to the user without the necessity of further installation effort, even some time afterwards. The VarioKeystone® cable plug is crimped to the installation cable easily and rapidly, thus turning the interface into a modularly replaceable jack module.
Various different plug faces are available for the VarioKeystone® jack module.

Structure:	full metal; zinc die-cast, nickel-plated
Wiring:	4 pairs via punchdown method according to EIA/TIA 568A
Strain relief:	via cable clips
Shielding:	large-surface 360° shield connection Contact block: black
Electrical values:	Cat. 6
Standards:	ISO/IEC 11801:2002, EN 50173-1:2002 (and TIA/EIA 568 B.2-1 for Cat. 6)

VarioKeystone® cable plug Cat. 6

Article no.	Name	Version
9A460053	VarioKeystone® cable plug (9.0 mm hole for AWG 23)	Cat. 6
9A460056	VarioKeystone® cable plug (10.0 mm hole for AWG 22)	Cat. 6

VarioKeystone®

Cable plug, pre-assembled

Category 7

Description
The cable plug is the interface between cable and jack module. Shield contacting is carried out via clamps with a cable clip. Depending on the performance class, the cable plug can be purchased for Cat. 6 or Cat. 7. The data cable is fitted with the cable plug at both ends.
It is especially suitable for clean rooms and/or rapid handling on location. During assembly, the cable plug is extrusion-coated with a strengthening compound which simultaneously acts as a protection against bending. The ready-made cable is delivered in ring form.

Structure: full metal; zinc die-cast, nickel-plated

Shielding: large-surface 360° shield connection
Contact block: white

Assignment: EIA/TIA 568A

Electrical values: Cat. 7

Standards: ISO/IEC 11801:2002, EN 50173-1:2002
(and TIA/EIA 568 B.2-1 for Cat. 6)

VarioKeystone® trunk with MegaLine® F10-115

Article no.	Name	Length*
9A060082	VarioKeystone® trunk cable plug Cat. 7	30.0 m
9A060084	VarioKeystone® trunk cable plug Cat. 7	40.0 m
9A060086	VarioKeystone® trunk cable plug Cat. 7	50.0 m
9A060088	VarioKeystone® trunk cable plug Cat. 7	60.0 m
9A060133	VarioKeystone® trunk cable plug Cat. 7/Crossconnect	30.0 m
9A060135	VarioKeystone® trunk cable plug Cat. 7/Crossconnect	40.0 m
9A060137	VarioKeystone® trunk cable plug Cat. 7/Crossconnect	50.0 m
9A060139	VarioKeystone® trunk cable plug Cat. 7/Crossconnect	60.0 m

* Standard lengths; other lengths available on request

Cable plug, pre-assembled

Category 6

Description
The cable plug is the interface between cable and jack module. Shield contacting is carried out via clamps with a cable clip. The data cable is fitted with the cable plug at both ends. It is especially suitable for clean rooms and/or rapid handling on location. During assembly, the cable plug is extrusion-coated with a strengthening compound which simultaneously acts as a protection against bending. The ready-made cable is delivered in ring form.

Structure: full metal; zinc die-cast, nickel-plated

Shielding: large-surface 360° shield connection
Contact block: black

Assignment: EIA/TIA 568A

Electrical values: considerably better than Cat. 6

Standards: ISO/IEC 11801:2002, EN 50173-1:2002
(and TIA/EIA 568 B.2-1 for Cat. 6)

VarioKeystone® trunk with MegaLine® F6-80

Article no.	Name	Length*
9A060010	VarioKeystone® trunk cable plug Cat. 6	10.0 m
9A060011	VarioKeystone® trunk cable plug Cat. 6	15.0 m
9A060012	VarioKeystone® trunk cable plug Cat. 6	20.0 m
9A060014	VarioKeystone® trunk cable plug Cat. 6	30.0 m
9A060016	VarioKeystone® trunk cable plug Cat. 6	40.0 m
9A060018	VarioKeystone® trunk cable plug Cat. 6	50.0 m
9A060020	VarioKeystone® trunk cable plug Cat. 6	60.0 m
9A060048	VarioKeystone® trunk cable plug Cat. 6/Crossconnect	30.0 m
9A060050	VarioKeystone® trunk cable plug Cat. 6/Crossconnect	40.0 m
9A060052	VarioKeystone® trunk cable plug Cat. 6/Crossconnect	50.0 m
9A060054	VarioKeystone® trunk cable plug Cat. 6/Crossconnect	60.0 m

* Standard lengths; other lengths available on request

Jack module 4K7

Category 7

Description
The 4K7 jack module for snapping onto the cable plug allows the transmission of analog and digital speech, image and data signals. The performance features correspond with Class F up to 600 MHz according to EN 50173-1:2002. Installation is carried out by snapping the jack module onto the cable plug. The shielded continuation of the data pairs ensures that the values of Cat. 7 are achieved reliably. The arrangement of the 4K7 jack in pairs ensures that each pair can be accessed separately via plug sharing with a standard TERA™ connecting plug. As a result, transmissions up to CATV 862 MHz as well as analog telephony are possible at the same time.

Structure: full metal; zinc die-cast, nickel-plated

Assembly dimension: according to the assembly dimension of the RJ45 jack module and thus interchangeable

Wiring: 4 pairs via cable plug

Electrical values: Cat. 7 / 600 MHz

Connection: jack 4K7

Standards: ISO/IEC 11801:2002, EN 50173-1:2002, EN 61076-3-104 Ed. 1.0

VarioKeystone® jack module 4K7

Article no.	Name	Version
9A460061	VarioKeystone® jack module 4K7	Cat. 7

Jack module 4K6

Category 6

Description
The 4K6 jack module for snapping onto the cable plug allows the transmission of analog and digital speech, image and data signals. The performance features correspond with Class EA up to 500 MHz according to EN 50173-1:2002. Installation is carried out by snapping the jack module onto the cable plug. The shielded continuation of the data pairs ensures that the values of Cat. 6 are achieved reliably. The arrangement of the 4K6 jack in pairs ensures that each pair can be accessed separately via plug sharing with a standard TERA™ connecting plug.

Structure: full metal; zinc die-cast, nickel-plated

Assembly dimension: according to the assembly dimension of the RJ45 jack module and thus interchangeable

Wiring: 4 pairs via cable plug

Electrical values: Cat. 6 plus / 500 MHz

Connection: jack 4K6

Standards: ISO/IEC 11801:2002, EN 50173-1:2002, EN 61076-3-104 Ed. 1.0

VarioKeystone® jack module 4K6

Article no.	Name	Version
9A460060	VarioKeystone® jack module 4K6	Cat. 6 plus

VarioKeystone®

Jack module RJ45

Category 6 de-embedded

Dual module RJ45

Category 6

Design 1

Design 2

Description
The RJ45 jack module for snapping onto the cable plug allows the transmission of analog and digital speech, image and data signals. The performance features correspond with Class E up to 250 MHz according to EN 50173-1:2002 and 10GBase-T up to 500 MHz. Installation is carried out by snapping the jack module onto the cable plug. The shielded continuation of the data pairs ensures that the values of Cat. 6 are achieved reliably.

Structure: full metal; zinc die-cast, nickel-plated

Wiring: 4 pairs via cable plug

Electrical values: Cat. 6 de-embedded, suitable for 10GBase-T up to 500 MHz

Standards: ISO/IEC 11801:2002, EN 50173-1:2002, IEC 60603-7-5/Ed. 1.0 (Draft 05.2002)

Description
Via the splitting of the four pairs over two RJ45 jacks, the RJ45 dual module allows reversible cable sharing.
The transmission data correspond with Cat. 6. Later retrofitting to Cat. 7 is possible at any time if the cable is fitted with Category 7 cable plugs. The dual module fits all VarioKeystone® patch panels and triple data outlets. The zinc die-cast housing offers maximum shielding and excellent stability.

Design 1	Design 2
Structure: full metal; zinc die-cast, nickel-plated	**Structure:** full metal; zinc die-cast, nickel-plated
Wiring: 2 * 2 pairs via cable plug	**Wiring:** 2 * 2 pairs via cable plug
Assignment: RJ45 jack A: 1.2 – 3.6 RJ45 jack B: 1.2 – 3.6	**Assignment:** RJ45 jack A: 1.2 – 3.6 RJ45 jack B: 3.6 – 4.5
Electrical values: Cat. 6	**Electrical values:** Jack A: Cat. 6, jack B: Cat. 5
Standards: ISO/IEC 11801:2002, EN 50173-1:2002	**Standards:** ISO/IEC 11801:2002, EN 50173-1:2002

VarioKeystone® jack module RJ45 Cat. 6 de-embedded

Article no.	Name	Version
9A460059	VarioKeystone® jack module RJ45	Cat. 6

VarioKeystone® dual module RJ45 Cat. 6

Article no.	Name	Version	Design
9A460093	VarioKeystone® dual module RJ45 Cat. 6	Cat. 6	1
9A460096	VarioKeystone® dual module RJ45 (100 base-T + ISDN)	Cat. 6/ Cat. 5	2

Link extender

Class F

Description
The link extender allows an existing cable infrastructure to be extended to up to 90 m without transmission losses on the basis of the VarioKeystone® system. Its small size allows it to be installed in the cable duct at any time afterwards too. It is necessary to connect a standard cable plug on one side and the Crossconnect plug on the other. This plug differs from the cable plug in that it has a red LSA insert. Depending on the link used, the link performance to be achieved is suitable for Class E and Class F. The extender is made of die-cast zinc. Each pair is continued with separate shielding, so the cable transmission data are only affected minimally. For this reason it is possible to go on transferring 10 Gigabit Ethernet via an extended link.

Structure: full metal; zinc die-cast, nickel-plated

Shielding: large-surface 360° shield connection

Electrical values: Class F

Standards: ISO/IEC 11801:2002,
EN 50173-1:2002

VarioKeystone® link extender

Article no.	Name	Version
9A460062	VarioKeystone® link extender	Class F

Crossconnect cable plug

Category 7

Description
The Crossconnect cable plug is fitted to the cable and serves as an interface between cable and link extender. Shield contacting is carried out via clamps with a cable clip. The cable plug corresponds with Cat. 7. Pre-assembled cable plugs are moulded or equipped with a self-adhesive shrinkable tube as bending protection.

Structure: full metal; zinc die-cast, nickel-plated

Wiring: 4 pairs via punchdown method

Strain relief: via cable clips

Shielding: large-surface 360° shield connection

Electrical values: Cat. 7

Standards: ISO/IEC 11801:2002
EN 50173-1:2002

VarioKeystone® Crossconnect cable plug

Article no.	Name	Version
9A460055	VarioKeystone® Crossconnect (9.0 mm hole for AWG 23)	Cat. 7
9A460058	VarioKeystone® Crossconnect (10.0 mm hole for AWG 22)	Cat. 7

VarioKeystone®

Patch field 19“

fixed

Description

The patch field can be equipped with up to 24 jack modules. It is possible to mix RJ45, 4K6 and 4K7. Strain relief for the data cables is ensured via cable clips. The patch field is earthed via a screw attachment on the back of the panel. As a result of its simple structure, this patch field provides a reasonably priced alternative to telescopic patch fields.

Structure: full metal housing for up to 24 jack modules (4K6, 4K7 or RJ45)
4 jack modules can be mounted per window

Strain relief: via cable clips

Cable entry: over the entire width of the cable management rail

Dimensions: 19”, 1 RU, 100 mm mounting depth

VarioKeystone® patch field, fixed

Article no.	Name	Colour*
9A670006	VarioKeystone® patch field, fixed, 6x4	RAL 7035

*Other colours available on request

Patch field 19“

telescopic

Description

The patch field can be equipped with up to 24 jack modules. It is possible to mix RJ45, 4K6 and 4K7. In the extended state, the drawer can be inclined downwards, thus making the various jack modules easy to change. Easy opening and closing of the drawer is ensured by an unlosable screw connection accessible on the front. In the mounted state, the data cables can be fixed to the drawer from the front via cable clips. The field is earthed via a riveted cable shoe on the left-hand and right-hand side of the drawer.

Structure: full metal housing for 24 jack modules (4K6, 4K7 or RJ45)
4 jack modules can be mounted per window

Strain relief: via cable clips

Cable entry: over the entire width of the cable management rail

Dimensions: 19”, 1 RU, 100 mm mounting depth

VarioKeystone® patch field, telescopic

Article no.	Name	Colour*
9A670000	VarioKeystone® patch field, telescopic, 6x4	RAL 7035

*Other colours available on request

6-port module housing

Description

The 6-port housing is suitable for use as a consolidation point and a mounting set also allows it to be used on top hat rails in electrical distribution.

Structure: module carrier:

galvanized sheet steel;
for up to 6 jack modules (4K6, 4K7 or RJ45)
earthing bolt M4
6 eyes for strain relief via cable clips
2 x push-down nut M4 in the bottom

Cover:

galvanized sheet steel, powder-coated RAL 7035
screen printing with MegaLineNet® logo and connections numbered 1-6

Assembly set for top hat rail:

consisting of 2 DIN rail springs and 2 M4 screws

VarioKeystone® 6-port module carrier and housing

Article no.	Name	Colour
9A670007	VarioKeystone® 6-port module carrier	Steel sheet
9A670008	VarioKeystone® cover	RAL 7035
9A670009	VarioKeystone® assembly set for DIN rail	Steel sheet

DIN rail housing

Description

The DIN rail housing is suitable for up to 2 VarioKeystone® modules. It is mounted by snapping it onto existing DIN rail housing. The metal housing is particularly suitable for industrial environments.

VarioKeystone® DIN rail housing

Article no.	Name	Colour
9A460097	Dual DIN rail housing with double DIN rail housing clip (95 mm x 85 mm x 35 mm) for 2 x VarioKeystone® jack modules	RAL 7035

VarioKeystone®

Outlets

Description
Depending on the version, the outlets are for one, two or three VarioKeystone® jack modules. They have a marking window.
The jacks are installed with a downward inclination of 30°.

Structure: full metal; zinc die-cast, nickel-plated

Assembly dimension: 50 x 50 mm

Components: for a maximum of 3 VarioKeystone® jack modules

VarioKeystone® outlet

Article no.	Name	Colour
9A460104	VarioKeystone® outlet single	RAL 1013
9A460105	VarioKeystone® outlet dual	RAL 1013
9A460106	VarioKeystone® outlet triple	RAL 1013
9A460107	VarioKeystone® outlet single	RAL 9010
9A460108	VarioKeystone® outlet dual	RAL 9010
9A460109	VarioKeystone® outlet triple	RAL 9010

VarioKeystone® outlet accessories

Article no.	Name	Colour
9A410002	UP cover frame single	RAL 1013
9A410003	UP cover frame single	RAL 9010
9A410004	UP cover frame dual	RAL 1013
9A410005	UP cover frame dual	RAL 9010
9A460087	Housing for surface mounting 40 mm incl. UP cover frame single	RAL 1013
9A460086	Housing for surface mounting 40 mm incl. UP cover frame single	RAL 9010
9A460089	Spacer frame for housing for surface mounting single 10 mm	RAL 1013

Carriers

for Ackermann underfloor systems

Tools

for cable assembly

Description
The carrier replaces the equipment carrier, thus offering maximum space in the cable feed. The slanting lead-away ensures reliable wire guidance even if the intermediate floors are very low. The carrier can be combined with various mounting modules. The mounting modules for VarioKeystone® jack modules 4K6, 4K7 and RJ45 are fixed to the carrier with two screws.

Structure: full metal housing, powder-coated, material 1.5 mm thick

Dimensions: according to the specifications for Ackermann underfloor systems

Example of components

Description
The tools are required for moulding the punchdown connectors and for carrying out all cable assembly operations

VarioKeystone® carrier Ackermann

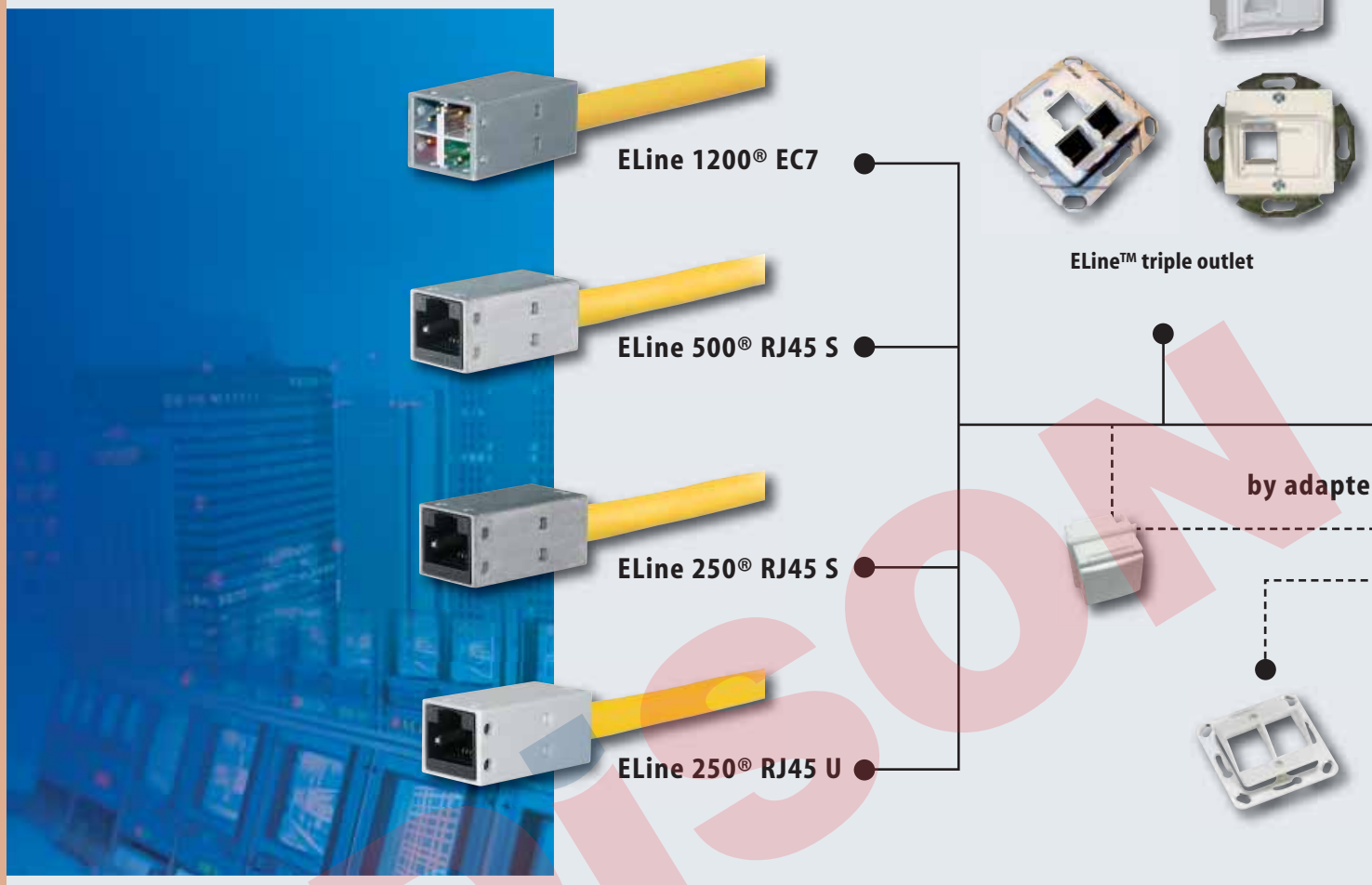
Article no.	Name	Colour*
9A460030	VarioKeystone® carrier for Ackermann GB3	RAL 9011
9A460031	VarioKeystone® mounting module 3 x VarioKeystone®	RAL 9011
9A460032	VarioKeystone® dummy plate	RAL 9011

*Other colours available on request

VarioKeystone® tools

Article no.	Name
9AW16007	VarioKeystone® parallel press tongs
9AW16006	VarioKeystone® unlocking tool
9AW16008	VarioKeystone® UTP/STP foil cutting tool

The ELine™ PREMIUM system

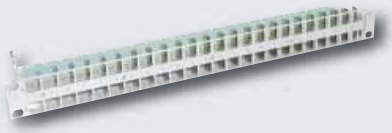


A combination meeting top requirements

The ELine™ PREMIUM system comprises the modular jacks ELine 1200® EC7 for multimedia applications, ELine 500® RJ45 S for Class E_A applications according to ISO/IEC 11801 (Amendment 1) for 10 Gigabit Ethernet via copper as well as ELine 250® RJ45 for Class E applications in a shielded and an unshielded version. Due to their especially compact design, these high-performance jacks are easy to integrate into high-density racks and wall outlets.

In addition to the ELine™ dual outlet, the ELine™ triple outlet provides space for up to three modular jacks. Besides the standard ELine™ panel with 24 ports, we offer the ELine™ 48-port panel with twice the packing density on only one rack unit. The product range also includes patch cords tailor-made for the application in question. The ELine™ PREMIUM range is rounded off by an extensive set of accessories for under-floor installation.

ELine™ 24 ports/1 RU panel



ELine™ 48 ports/1 RU panel

ELine™ floorbox adapter
(Ackermann, Kleinhuis, Deutsche Elektraplan)

compatible with the PREMIUM series

ELine™ 32 ports/2 RU panel

ELine™ 16 ports/1 RU panel

ELine™ mini patch 6 ports

	Multimedia shielded		**Class E_A / Cat. 6 shielded**		**Class E / Cat. 6 shielded**		**Class E / Cat. 6 unshielded**	
	ELine 1200® EC7	Article no.	ELine 500® RJ45 S	Article no.	ELine 250® RJ45 S	Article no.	ELine 250® RJ45 U	Article no.
MegaLine® cable	G12-150 S/F SY22 SY23 F10-130 S/F F10-115 S/F	7KS80001 7KS01654 7KS01568 7KS70001 7KS70008	F10-130 S/F F10-115 S/F F6-90 S/F	7KS70001 7KS70008 7KS70010	F10-115 S/F F6-90 S/F E5-70 S/F	7KS70008 7KS70010 7KS60020	E2-30 U/U	7KS60001
ELine™ jack	EC7	9ZE44444	500 RJ45 S	9ZE33333	250 RJ45 S	9ZE30001	250 RJ45 U	9ZE30009
ELine™ outlet (50 x 50)	dual triple	9ZE30041 9ZE30010	dual triple	9ZE30041 9ZE30010	dual triple	9ZE30041 9ZE30010	dual triple	9ZE30041 9ZE30010
ELine™ panel 19″	24 ports 1 RU 48 ports 1 RU	9ZE30002 9ZE30008	24 ports 1 RU 48 ports 1 RU	9ZE30002 9ZE30008	24 ports 1 RU 48 ports 1 RU	9ZE30002 9ZE30008	24 ports 1 RU 48 ports 1 RU	9ZE30002 9ZE30008
ELine™ floorbox holder*	GB2 complete for a maximum of 2 inserts							9ZE60001
floorbox holder*	GB3 complete for a maximum of 3 inserts							9ZE60002
Insert for floorbox holder	Insert for floorbox holder (up to 3 jacks)							9ZE60006
ELine™ patch cord flex (selection)	EC7-RJ45 0.5m EC7-RJ45 1.0m EC7-RJ45 2.0m EC7-RJ45 3.0m EC7-RJ45 5.0m	9KE03005 9KE03010 9KE03020 9KE03030 9KE03050	RJ45-RJ45 1.0 m RJ45-RJ45 2.0 m RJ45-RJ45 3.0 m RJ45-RJ45 5.0 m RJ45-RJ45 10 m	9A021133 9A021135 9A021137 9A021139 9A021141	RJ45-RJ45 1.0 m RJ45-RJ45 2.0 m RJ45-RJ45 3.0 m RJ45-RJ45 5.0 m RJ45-RJ45 10 m	9A021133 9A021135 9A021137 9A021139 9A021141	RJ45-RJ45 1.0 m RJ45-RJ45 2.0 m RJ45-RJ45 3.0 m RJ45-RJ45 5.0 m RJ45-RJ45 10 m	9A050028 9A050030 9A050032 9A050034 9A050036

* Other versions available on request

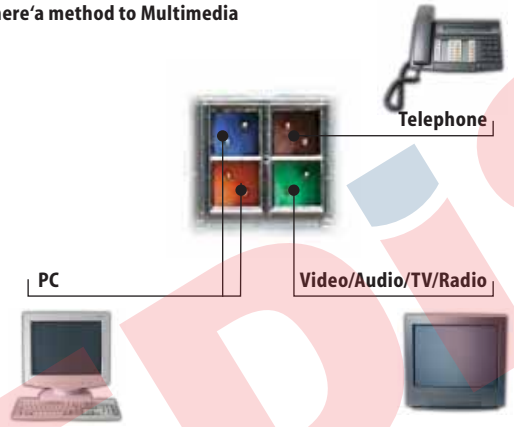
ELine 1200® EC7 – Multimedia up to 1.5 GHz via twisted pairs!

If a passive cabling system is connected with the term "multimedia", the question which immediately arises is "how does that all go together?" – after all, the term is more well-known in connection with products from entertainment electronics. But ELine 1200® EC7 really does manage multimedia, because it allows the parallel use of different media via structured in-house cabling: data, voice, image and even television.

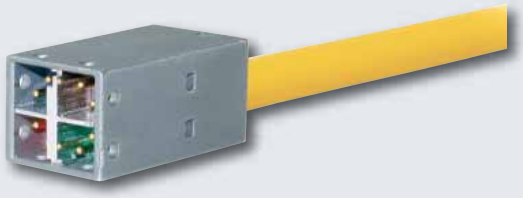
ELine 1200® EC7 – the concept

Since the early 1990s, LEONI Kerpen has been offering 100 Ω data cables of the MegaLine® series with individual shielding of each pair. This principle was the model for the chamber system used in the ELine 1200® EC7 plug connector.

There'a method to Multimedia

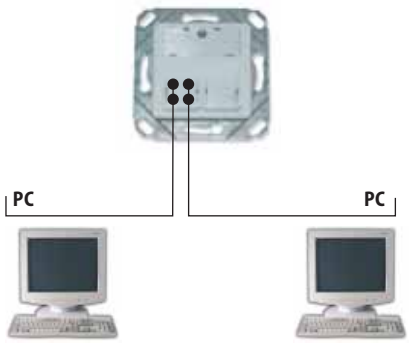


The 4 individually shielded chambers, each containing one pair, make the EC7 plug connector an ideal improvement on individually shielded S/FTP cables.

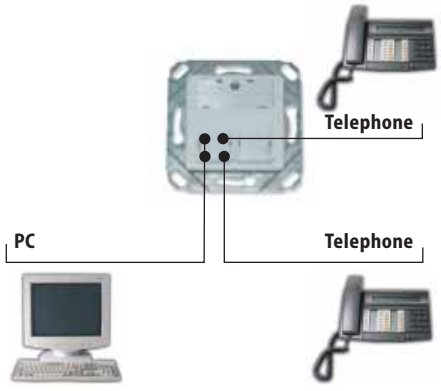


Cable and plug connector form the ideal symbiosis:
4 pairs = 4 chambers with GHz performance.
The advantages are obvious: Consistent separation of the signal paths in an ideally matched system expands the possible applications in unimagined ways.
It is thus also possible to use two data services of Class A to F simultaneously via only one cable and one EC7 jack. However, different services such as telephone and data services can also be operated in parallel without the risk of NEXT problems. These possibilities are referred to under the name of "cable-sharing" or "service-sharing".
The units are connected via appropriately matched 4-, 2- or 1-pair ELine 1200® EC7 work area cords:

2 data services of Class A to F



Mixed telephone/data services



TV via twisted pairs!

The task of transmitting analogue CATV services via twisted pairs is technically very demanding. In order to be able to transmit all channels, transmission frequencies of up to 862 MHz are necessary – this demands the utmost in reserve performance of the system and especially good attenuation characteristics.

During development, ELine 1200® EC7 was optimised especially for this purpose, the current product range providing a wide range of tools for transmitting CATV signals.

The world of twisted pairs (100 Ω) is connected to the world of television (75 Ω) via twisted passive work area cords with an integrated balun.

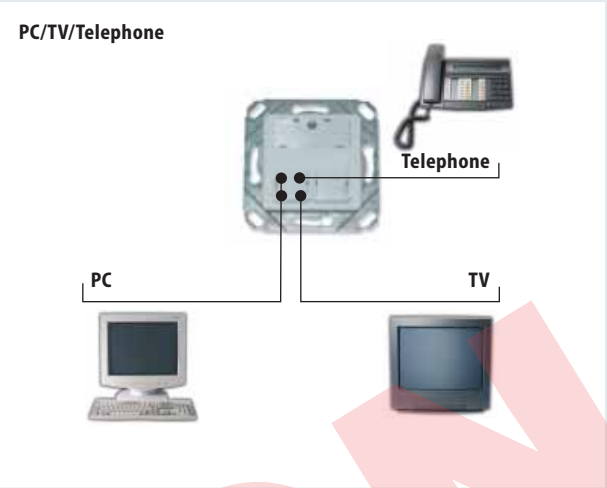
In contrast to conventional solutions, outlets can be used flexibly: Thus, from being a telephone or data outlet, EC7 is easy to turn into a TV connection later if necessary.

Economy!

There is a price to pay for "high-tech" and "added value". In the long run, it is not necessary for the system to cost more than conventional systems, which usually require a special cable and a special plug connector for each service.

ELine 1200® EC7 allows you to save up to 50 % of the cables, plug connectors, outlets and patch fields. Multiple use reduces the system costs by between 15 and 30 % (depending on the services used).

The reduction in the number of cables and outlets required usually allows reductions in the costs for cable channels, switching cabinets etc. "Service-sharing" via ELine 1200® EC7 allows you to cut costs.



Our experience!

ELine 1200® EC7 includes many innovative new ways of going about things. This is why it could come as a surprise to discover that LEONI Kerpen introduced it into the market as early as 1996. Since then we have cooperated closely with our customers at all times, so that many of our customers' ideas on adding to or optimising our products have been included into the system concept over the last years.

Thus, ELine 1200® EC7 now includes a sophisticated system solution which follows the market requirements and is unparalleled at present!

As a four-lane data highway, ELine 1200® EC7 provides true multimedia "to the desk".

This is appreciated by customers all over the world – we can refer you to a widely installed basis with top references. Why not ask us for our up-to-date list?

ELine 1200® EC7 jack, pair separator from front and strain relief

New jack design!

The ELine 1200® EC7 jack has been completely redesigned. Its robust full-metal design allows it to be integrated completely into the panel and the outlets used for the ELine™ PREMIUM series. This allows the use of up to 3 EC7 jacks in the PREMIUM outlet and up to 48 ports on one height unit in the switching cabinet! The PREMIUM series also allows the mixed equipping of outlets and panel with the Cat. 6 jacks ELine 250® RJ45 S and ELine 250® RJ45 U (mixed-media application).

Last but not least the new three part jack has dramatically reduced installation times in comparison to the old EC7 jack. The new jack consists of 3 individual elements only, thus allowing rapid and extremely easy assembly. The completely redesigned ELine 1200® EC7 jack makes assembly child's play and further improves performance while leaving the interface unchanged!

Backward-compatible!

Our multimedia system has been put to widespread use over the years and made many friends. This is why it was especially important for us to keep the system backward-compatible to the old range although the jack was redesigned:
It goes without saying that all patch cords and work area cords ever supplied also fit into the new EC7 jack. Adapter clips allow the retrofitting of existing panels from the old ELine™ outlet/panel program. More bandwidth, more flexibility with regard to connections, a more reliable future and more unbeatable value for money are not provided by any other system solution!

Technical data

Compatible outlets/panels etc.

- See PREMIUM series
- ELine 1200® EC7 (old series) via ELine™ mounting clip (Article number: 9ZE30021)

Category

- Better than Category 7/Class F according to ISO/IEC 11801 and EN 50173 2nd Edition
- Better than IEC 15018 SOHO standard

Jack type

- EC7 multimedia jack
- New design:
  Full metal body
  3-part jack set
- Shielded
- Connection method: push-in, gas-tight IDC
- Shielding: 360°
- Recommended conductors: AWG 22/23
- Colour coding

Jacks and outlets

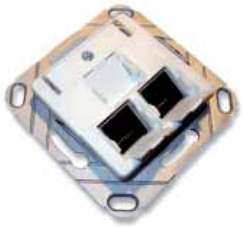
Multimedia – 1.5 GHz

ELine 1200® EC7 jack
16 x 14 x 36.9 mm (WxHxD)
Mounting depth: 40 mm

Product description

- Jack body: zinc die-cast, silver-plated
- Strain relief: nickel silver
- Contacts: gold-plated
- IDC contacts: bronze, tinned
- Short assembly time
- Suitable for use in patch panels, floorboxes and outlet inserts of the PREMIUM series

Article no.:
9ZE44444
Pcs. per packing unit: 8



ELine™ PREMIUM triple outlet insert
50 x 50 x 30.5 mm (WxHxD)
Mounting depth: 25 mm
Inclination: 30°

Product description

- Without components
- Suitable for mounting in parapet ducts and for surface mounting, concealed mounting and many underfloor systems
- M4 thread for earth connection
- Dust protection cover
- Delivery without cover frame
- For up to 3 jacks
- Compatible with ELine 1200® EC7, ELine 500® RJ45 S, ELine 250® RJ45 S, ELine 250® RJ45 U
- Pure white, RAL 9010

Article no.:
9ZE30010
Pcs. per packing unit: 8

* other outlets see „VarioLine®"

ELine™ PREMIUM dual outlet insert
50 x 50 x 30.5 mm (WxHxD)
Mounting depth: 25 mm
Inclination: 30°

Product description

- Without components
- Suitable for mounting in parapet ducts and for surface mounting, concealed mounting and many underfloor systems
- M4 thread for earth connection
- Dust protection cover
- Delivery without cover frame
- For up to two modules
- Compatible with ELine 1200® EC7, ELine 500® RJ45 S, ELine 250® RJ45 S, ELine 250® RJ45 U
- Pure white, RAL 9010

Article no.:
9ZE30041
Pcs. per packing unit: 8

* other outlets see „VarioLine®"

Patch panels

Multimedia – 1.5 GHz

ELine™ PREMIUM
patch panel,
1 RU, 24 ports (RJ45/EC7)
483 x 1 RU x 98 mm (WxHxD)

Product description

- Without components; for a maximum of 24 jacks (including mixed media):
  ELine 1200® EC7,
  ELine 500® RJ45 S,
  ELine 250® RJ45 S,
  ELine 250® RJ45 U
- Front panel light grey, RAL 7035 / black RAL 9005
- Snap-in assembly
- Mounting clip not required
- Traction relief
- Earth connection

Article no.:	Colour
9ZE30002	light grey, RAL 7035
9ZE30046	black, RAL 9005
Pcs. per packing unit: 1	

ELine™ PREMIUM
patch panel,
1 RU, 48 ports (RJ45/EC7)
483 x 1 RU x 98 mm (WxHxD)

Product description

- Without components; for a maximum of 48 jacks (including mixed media):
  ELine 1200® EC7,
  ELine 500® RJ45 S,
  ELine 250® RJ45 S,
  ELine 250® RJ45 U
- Front panel light grey, RAL 7035 / black RAL 9005
- Snap-in assembly
- Mounting clip not required
- Traction relief
- Earth connection

Article no.:	Colour
9ZE30008	light grey, RAL 7035
9ZE30047	black, RAL 9005
Pcs. per packing unit: 1	

Trunk and CP cables

ELine 1200® EC7
trunk and CP cables

Product description

- The ELine 1200® EC7 trunk and CP cable is based on an F10-120 S/F flex cable and is equipped with an ELine 1200® EC7 plug and an ELine™ EC7 jack. The high-quality components used result in a product which meets the requirements of Class F according to ISO/IEC 11801
- Ready-made cable F10-120 S/F flex,
  A side: EC7 plug
  B side: ELine 1200® EC7 jack

Article no.:	Length
9KEJ8050	5 m
9KEJ8100	10 m
9KEJ8150	15 m
9KEJ8200	20 m
9KEJ8250	25 m
9KEJ8300	30 m
Pcs. per packing unit: 1	

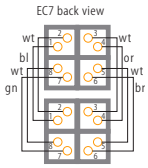
Other lengths available on request

Patch cords and work area cords

Data




ELine 1200® EC7 patch cord/work area cord

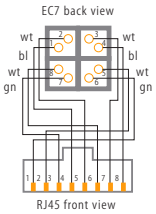


Product description

- 4P (7KS70014), light grey, RAL 7035
- A end equipped with 4-pair EC7 plug
- B end equipped with 4-pair EC7 plug
- Assignment: 1/1
- Colour of bending protection sleeve EC7/EC7: yellow
- Application: Gigabit Ethernet

Article no.:	Length
9KEC1010	1.0 m
9KEC1020	2.0 m
9KEC1030	3.0 m
9KEC1050	5.0 m
Pcs. per packing unit: 1	

ELine 1200® EC7 patch cord/work area cord

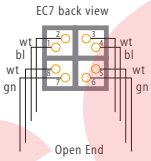


Product description

- 4P (7KS70014), light grey, RAL 7035
- A end equipped with 4-pair EC7 plug
- B end equipped with RJ45 plug
- Assignment EC7-RJ45: 1/2-4/5, 3/4-7/8, 5/6-2/1, 7/8-3/6
- Colour of bending protection sleeve EC7/RJ45: yellow
- Application: Gigabit Ethernet

Article no.:	Length
9KEC2010	1.0 m
9KEC2020	2.0 m
9KEC2030	3.0 m
9KEC2050	5.0 m
Pcs. per packing unit: 1	

ELine 1200® EC7 patch cord/work area cord

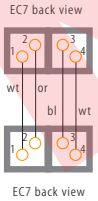


Product description

- 4P (7KS70014), light grey, RAL 7035
- A end equipped with 4-pair EC7 plug
- Colour of bending protection sleeve EC7/RJ45: yellow
- B end without components (for self-mounted RJ45 plug etc.)

Article no.:	Length
9KEC0010	1.0 m
9KEC0020	2.0 m
9KEC0030	3.0 m
9KEC0050	5.0 m
Pcs. per packing unit: 1	

ELine 1200® EC7 patch cord/work area cord



Product description

- 2P (7KS70019), light grey, RAL7035
- A end equipped with 2-pair EC7 plug
- B end equipped with 2-pair EC7 plug
- Colour of bending protection sleeve: light grey, RAL 7035

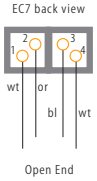
Article no.:	Length
9KE01005	0.5 m
9KE01010	1.0 m
9KE01020	2.0 m
9KE01030	3.0 m
9KE01050	5.0 m
Pcs. per packing unit: 1	

Patch cords and work area cords

Data




ELine 1200® EC7 patch cord/work area cord

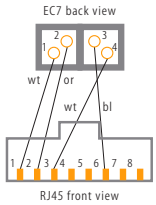


Product description

- 2P (7KS70019), light grey, RAL7035
- A end equipped with 2-pair EC7 plug
- B end unterminated (for self-mounted RJ45 plug etc.)
- Colour of bending protection sleeve: light grey, RAL 7035

Article no.:	Length
9KE02005	0.5 m
9KE02010	1.0 m
9KE02020	2.0 m
9KE02030	3.0 m
9KE02050	5.0 m
Pcs. per packing unit: 1	

ELine 1200® EC7 patch cord/work area cord

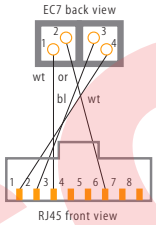


Product description

- 2P (7KS70019), light grey, RAL7035
- A end equipped with 2-pair EC7 plug
- B end equipped with RJ45 plug
- Assignment RJ45: 1/2, 3/6
- Colour of bending protection sleeve EC7/RJ45: yellow
- Sticker: Crossover
- Application: Ethernet crossover

Article no.:	Length
9KE31005	0.5 m
9KE31010	1.0 m
9KE31020	2.0 m
9KE31030	3.0 m
9KE31050	5.0 m
Pcs. per packing unit: 1	

ELine 1200® EC7 patch cord/work area cord

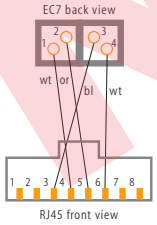


Product description

- 2P (7KS70019), light grey, RAL7035
- A end equipped with 2-pair EC7 plug
- B end equipped with RJ45 plug
- Assignment RJ45: 1/2, 3/6
- Colour of bending protection sleeve EC7/RJ45: yellow
- Application: Ethernet

Article no.:	Length
9KE03005	0.5 m
9KE03010	1.0 m
9KE03020	2.0 m
9KE03030	3.0 m
9KE03050	5.0 m
Pcs. per packing unit: 1	

ELine 1200® EC7 patch cord/work area cord



Product description

- 2P (7KS70019), light grey, RAL7035
- A end equipped with 2-pair EC7 plug
- B end equipped with RJ45 plug
- Assignment RJ45: 3/6, 4/5
- Colour of bending protection sleeve EC7/RJ45: blue
- Application: Token Ring

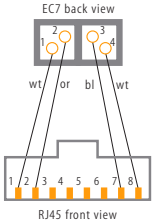
Article no.:	Length
9KE04005	0.5 m
9KE04010	1.0 m
9KE04020	2.0 m
9KE04030	3.0 m
9KE04050	5.0 m
Pcs. per packing unit: 1	

Patch cords and work area cords

Data

Telephone

ELine 1200® EC7 patch cord/work area cord

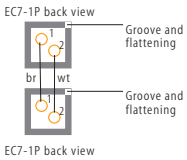


Product description

- 2P (7KS70019), light grey, RAL7035
- A end equipped with 2-pair EC7 plug
- B end equipped with RJ45 plug
- Assignment RJ45: 1/2, 3/6
- Colour of bending protection sleeve EC7/RJ45: green
- Application: ATM and TP-PMD

Article no.:	Length
9KE05005	0.5 m
9KE05010	1.0 m
9KE05020	2.0 m
9KE05030	3.0 m
9KE05050	5.0 m
Pcs. per packing unit: 1	

ELine 1200® EC7 patch cord/work area cord

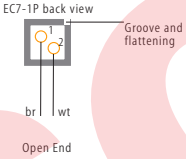


Product description

- 3 conductors (7KS01184), black
- A end equipped with 1-pair EC7 plug
- B end equipped with 1-pair EC7 plug
- Colour of bending protection sleeve: black
- Application: analog and digital telecommunication systems

Article no.:	Length
9KE74005	0.5 m
9KE74010	1.0 m
9KE74020	2.0 m
9KE74030	3.0 m
9KE74050	5.0 m
Pcs. per packing unit: 1	

ELine 1200® EC7 patch cord/work area cord

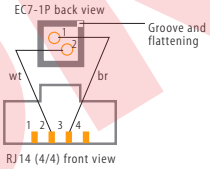


Product description

- 3 conductors (7KS01184), black
- A end equipped with 1-pair EC7 plug
- Colour of bending protection sleeve: black
- B end unterminated (for self-mounted RJ11 plug etc.)
- Application: analog and digital telecommunication systems

Article no.:	Length
9KE75005	0.5 m
9KE75010	1.0 m
9KE75020	2.0 m
9KE75030	3.0 m
9KE75050	5.0 m
Pcs. per packing unit: 1	

ELine 1200® EC7 patch cord/work area cord



Product description

- 3 conductors (7KS01184), black
- A end equipped with 1-pair EC7 plug
- Colour of bending protection sleeve: black
- B end equipped with RJ10 plug (4/4)
- Application: analog and digital telecommunication systems

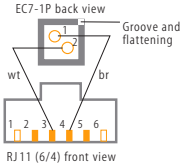
Article no.:	Length
9KE76005	0.5 m
9KE76010	1.0 m
9KE76020	2.0 m
9KE76030	3.0 m
9KE76050	5.0 m
Pcs. per packing unit: 1	

Patch cords and work area cords

Telephone




ELine 1200® EC7 patch cord/work area cord

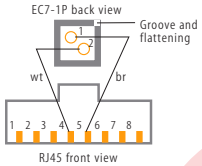


Product description

- 3 conductors (7KS01184), black
- A end equipped with 1-pair EC7 plug
- Colour of bending protection sleeve: black
- B end equipped with RJ11 plug (6/4)
- Application: analog and digital telecommunication systems

Article no.:	Length
9KE78005	0.5 m
9KE78010	1.0 m
9KE78020	2.0 m
9KE78030	3.0 m
9KE78050	5.0 m
Pcs. per packing unit: 1	

ELine 1200® EC7 patch cord/work area cord

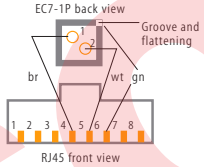


Product description

- 3 conductors (7KS01184), black
- A end equipped with 1-pair EC7 plug
- Colour of bending protection sleeve: black
- B end equipped with RJ45 plug
- Application: digital telephony

Article no.:	Length
9KE79005	0.5 m
9KE79010	1.0 m
9KE79020	2.0 m
9KE79030	3.0 m
9KE79050	5.0 m
Pcs. per packing unit: 1	

ELine 1200® EC7 patch cord/work area cord

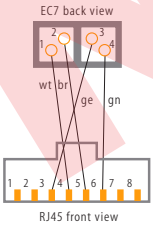


Product description

- 3 conductors (7KS01184), black
- A end equipped with 1-pair EC7 plug
- Colour of bending protection sleeve: black
- B end equipped with RJ45 plug
- Application: analog telephony for terminal devices with earth key

Article no.:	Length
9KE80005	0.5 m
9KE80010	1.0 m
9KE80020	2.0 m
9KE80030	3.0 m
9KE80050	5.0 m
Pcs. per packing unit: 1	

ELine 1200® EC7 patch cord/work area cord



Product description

- 4 conductors (7KS01184), black
- A end equipped with 2-pair EC7 plug
- Colour of bending protection sleeve: black
- B end equipped with RJ45 plug, without bending protection
- Assignment RJ45: 3/6, 4/5
- Application: ISDN

Article no.:	Length
9KE67005	0.5 m
9KE67010	1.0 m
9KE67020	2.0 m
9KE67030	3.0 m
9KE67050	5.0 m
Pcs. per packing unit: 1	

Components

CATV

ELine 1200® EC7
CATV work area cord

Product description

- 1 conductor (7KS70040), grey
- A end equipped with EC7 1P plug
- Colour of bending protection sleeve: black
- B end equipped with CATV balun 100/75 W F plug (slide-on)
- Additional adapter: F jack to IEC plug
- Application: CATV cable

Article no.:	Length
9KE30002	0.2 m
9KE30010	1.0 m
Pcs. per packing unit: 1	

ELine 1200® EC7
CATV patch cord

Product description

- 1 conductor (7KS70040), grey
- A end equipped with EC7 1P plug
- B end equipped with EC7 1P plug
- Colour of bending protection sleeve: black
- Application: CATV patch cord for 2 x quadruple balun etc.

Article no.:	Length
9KE69005	0.5 m
9KE69010	1.0 m
9KE69020	2.0 m
9KE69030	3.0 m
9KE69050	5.0 m
Pcs. per packing unit: 1	

ELine 1200® EC7 CATV
1 x quadruple balun 75/100 ohm

Product description

- 1 x quadruple 75/100 ohm (distributor insert)
- 8 dB attenuation at 862 MHz
- Input: 1 x coax, F jack (75 ohm)
- Output: ELine 1200® EC7 jack (4 x 1P 100 ohm)
- Aluminium housing with mounting thread, also suitable for earth connection
- Application: 4 x CATV balun function
- Included in the scope of delivery:
  1 mounting clip for mounting in panels and housings
  2 terminating resistors

Article no.:
9ZE30027
Pcs. per packing unit: 1

Components

CATV

ELine 1200® EC7
TV equalizer

Product description

- Equalization 9 dB at 10 MHz
- Can be cascaded and combined with a second equalizer (18 dB) via a screw thread

Article no.:
9ZE10511
Pcs. per packing unit: 1

ELine 1200® EC7
TV equalizer

Product description

- Equalization 18 dB at 10 MHz
- Can be cascaded and combined with a second equalizer (9 dB) via a screw thread

Article no.:
9ZE10512
Pcs. per packing unit: 1

Telephone

ELine 1200® EC7
telephone patch panel
485 x 44 x 106 mm (WxHxD)
Mounting depth: 104 mm

Product description

- Complete with 25 x (1 x 4) two-conductor jacks
- 100 double conductors for operation with up to 100 telephone services on 1 RU
- Rear connections 25 x 8 LSA
- Punch-down connections on 5 x 5 basic modules

Article no.:
9ZE10221
Pcs. per packing unit: 1

Other accessories

ELine 1200® EC7 bending protection sleeve

Product description

- For ELine 1200® EC7 patch cords and work area cords
- Reversible fastening
- Available in different colours for optical coding

Article no.:	Colour
9ZE10069	red
9ZE10070	blue
9ZE10071	yellow
9ZE10072	green
9ZE10074	black
9ZE10075	grey
Pcs. per packing unit: 50	

ELine 1200® EC7 terminator plug

Product description

- EC7 resistive plug, 2P, with 2 x 100 Ω terminator resistors
- Application: Pluggable terminator for ISDN So-Bus networks ELine 1200® EC7

Article no.:
9ZE10104
Pcs. per packing unit: 1

Measuring equipment

ELine 1200® EC7 measuring adapter pair for Fluke DTX 1,800

Product description

- Suitable for testing EC7 cabling systems up to Class F (600 MHz), permanent link and channel
- Measuring tip consists of an EC7 back-to-back plug which can be replaced when worn out

Article no.:
9ZE30038
Pcs. per packing unit: 1 pair

ELine 1200® EC7 back-to-back plug

Product description

- ELine 1200® E7 back-to-back plug
- Plug face: four-pair EC7 on both sides
- Application: EC7 measuring tip for Class F measurements, for permanent link and channel measuring adapter for Fluke DTX 1,800

Article no.:
9ZE30043
Pcs. per packing unit: 1

ELine 500® RJ45 S –

a new cabling system for 10 Gigabit Ethernet

The ELine 500® RJ45 S RJ45 S from LEONI Kerpen is a new shielded RJ45 cabling system specially developed and optimized for the transmission standard 10 Gigabit Ethernet (IEEE 802.3an)*.

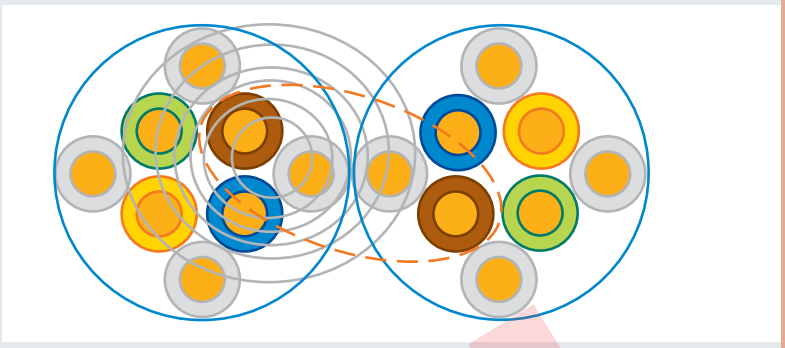


Fig. 2: "Diagram of Alien NEXT"

10 Gigabit Ethernet

With a transmission performance 10 times as high as that prescribed by the old 1,000 BASE–T standard, the requirements for cabling systems designed to meet the demands of the future have also increased considerably.

In order to guarantee the transmission of 10 GbE, the relevant cabling committees have agreed on the standardisation of a new Class E_A with a bandwidth of **500 MHz**. As with ISO/TEC 11801 and EN 50173 2nd Edition, a channel with a length of 100m is to be supported using a maximum number of 4 connector transitions.

In order to improve the signal-to-noise ratio which is critical at 10 GbE, it is also planned to reduce the attenuation and to define the Alien NEXT for the first time with the aim of reducing interference to a minimum.

Alien NEXT is the sum of the interference affecting a data pair in a cable A and induced by one or more data pairs in an adjacent cable B.

The use of shielded cabling is the safest and most economical method of reducing the Alien NEXT to a negligible value.

Fig. 1: "The new ELine 500® RJ45 S jack from LEONI Kerpen"

* according to ISO/IEC 11801 (Amendment 1)

ELine 500® RJ45 S – performance

Although the future cabling standard provides for a bandwidth of 500 MHz, ELine 500® RJ45 S was evaluated up to a maximum frequency of 625 MHz.

a) The NEXT of ELine 500® RJ45 S has a security reserve of >15 dB up to 300 MHz compared with the limits of Class E. The security reserve is still >5dB compared with the limits extrapolated up to 500 MHz.

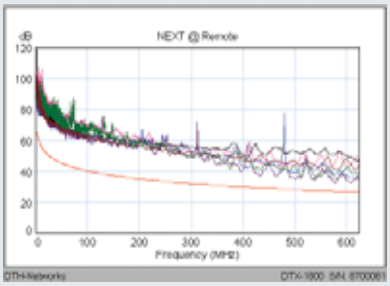


Fig. 3: "NEXT curve" up to 625 MHz

b) The RL curve shows excellent homogeneity of the components selected within the ELine 500® RJ45 S cabling system.

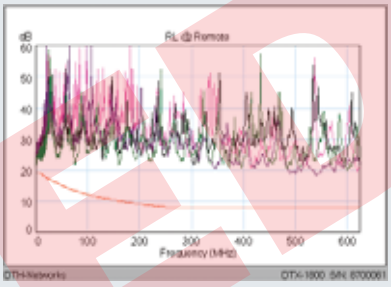


Fig. 4: "RL curve" up to 625 MHz

c) The ELFEXT of ELine 500® RJ45 S behaves extremely safely, especially at the limits above 500 MHz.

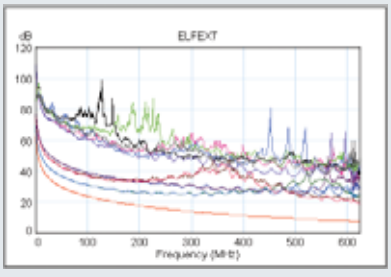


Fig. 5: "ELFEXT curve" up to 625 MHz

The measurements were carried out successfully on long cable links (80 m) as well as short ones (15 m).

ELine 500® RJ45 S – short description

Extremely well-matched components are used for ELine 500® RJ45 S.
The jack is an improved version of the ELine 250® RJ45 S jack. The dimensions have remained unchanged. However, the engine at the heart of it has been optimised once more for frequencies of more than 250 MHz. The refined surface of the housing allowed optimum shield attenuation values to be achieved. The high-quality products MegaLine® F6-90 S/F and F6-90 S/F flex tested at more than 600 MHz are used as cables.

ELine 500® RJ45 S – other highlights in a nutshell

Space-saving
The components of the ELine 500® RJ45 S system have especially small dimensions. 3 jacks fit into the space taken up by a conventional dual outlet. A new panel with 1 RU provides room for 48 ports.

Extremely easy to mount
Only three components in one compact high-grade zinc die-cast housing – the ELine 500® RJ45 is easy to mount quickly and safely. The clear colour coding virtually makes mounting errors and the resulting additional costs a thing of the past. The compact ELine 500® RJ45 S modules can be mounted in panel and outlet from the front and from the back.

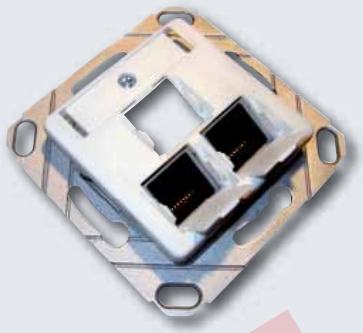
Compatible
The ELine 500® RJ45 S is part of the PREMIUM product family and is therefore compatible with the existing ELine 1200® EC7 and ELine 250® RJ45 S components.

Economical
Easy to mount, designed to meet the demands of the future and priced to suit the market – all in all, ELine 500® RJ45 S is a highly economical system with a high degree of investment protection!

ELine 250® RJ45 – the real Category 6

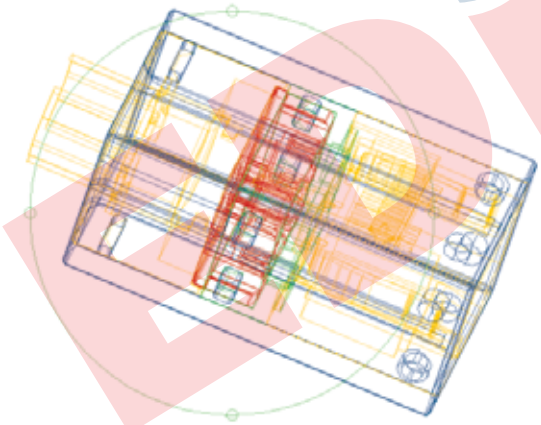
ELine 250® RJ45 S (shielded) and ELine 250® RJ45 U (unshielded)

ELine 250® RJ45 jacks of the PREMIUM system were developed for the highest of demands:
Optimum performance, easy assembly and compact design for high packing density make this series unique.
In addition, the dimensions of the housing are compatible with the multimedia jack ELine 1200® EC7. This ensures problem-free upgrading within the PREMIUM system.



ELine 250® RJ45: the concept

ELine 250® RJ45 plug connectors are based on completely redesigned plug connections. Extremely short individual contacts and a multilayer circuit board of a very short design are used.
The concept makes parallel conductors largely unnecessary, thus minimising coupling between the individual pairs of contacts.



The benefits!

Space-saving

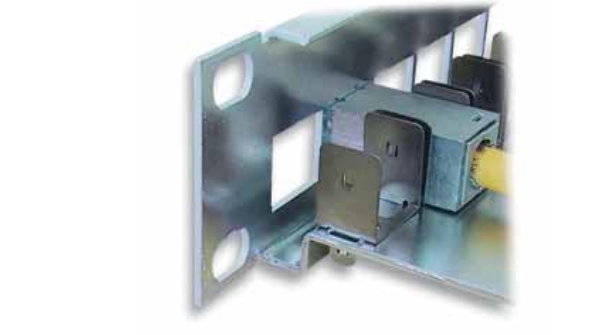
The ELine 250® RJ45 is very much smaller than conventional RJ45 plug connectors and provides maximum performance in a small space. The components of the ELine 250® RJ45 system have especially small dimensions.
A triple outlet only takes up the space of a conventional dual outlet. A new panel with 1 RU provides room for 24/48 ports. Of course, the conventional panels in the ELine™ system can also be used via mounting clips.

Extremely easy to mount!

ELine 250® RJ45 is a convincing solution due to its simple, rapid and flexible (modular) connecting technology. Only three components in one compact zinc die-cast housing – the ELine 250® RJ45 is easy to mount quickly and safely. The clear colour coding virtually makes mounting errors and the resulting additional costs a thing of the past. Protection from incorrect use via RJ11, RJ12 or incorrectly moulded RJ45 work area cords increases safety. The compact ELine 250® RJ45 modules can be mounted in panels and outlets from the front and from the back.

The fully shielded ELine 250® RJ45 offer good electromagnetic compatibility and supports EN 55022/50082.

Technical data



The real Cat. 6!

Thanks to the revolutionary design, a worldwide first, ELine 250® RJ45 goes far beyond all requirements of Class E/Category 6 according to ISO/IEC 11801 and EN 50173, 2nd Edition. Measurements and certificates from the accredited test laboratory GHMT prove the excellent electrical characteristics of the system. ELine 250® RJ45 offers maximum performance even in worst case configurations in a 4-connector channel and a 3-connector permanent link. The excellent values for NEXT, ELFEXT and ACR provide maximum headroom in comparison to the standard for all pair combinations up to 250 MHz.
The certification of the ELine 250® RJ45 module according to Category 6 (de-embedded measuring method according to IEC 60603-7-5 and TIA 586 B 2.1) gives the system the rating **'real Category 6'.**

What we recommend today

Invest in ELine 250® RJ45 for standardised Class E cabling with excellent transmission characteristics, for example in connection with MegaLine® F6-90 S/F and MegaLine® E5-70 S/F flex.

Compatible outlets/panels etc.

- See PREMIUM series (pages 86-87)

Category

- Better than Category 5 and Category 6 according to ISO/IEC 11801 and EN 50173 2nd Edition for Class D (up to 100 MHz) and Class E (up to 250 MHz)
- Cat. 6 de-embedded according to EIA/TIA-568-B.2-1

Jack type

- RJ45, Cat. 6 (de-embedded) for 250 MHz performance
- Shielded (ELine 250® RJ45 S, Article number: 9ZE30001) or
- Unshielded (ELine 250® RJ45 U, Article number: 9ZE30009)
- Connecting method: punch-down, gas-tight IDC
- Recommended conductors: AWG 23/ ..22
- Colour coding

Certificates

- Certified by GHMT according to:
  - Class E in a 3-connector permanent link
  - Class E in a 4-connector channel
  - According to ISO/IEC 11801 and EN 50173 2nd Edition
- Cat. 6 de-embedded

Jacks

ELine 500® RJ45 S jack
16 x 14 x 36.9 mm (WxHxD)
Mounting depth: 40 mm

Product description
- Jack body: zinc die-cast, silver-plated
- Strain relief: nickel silver
- Contacts: 8-pole RJ45 jack
- Short assembly time
- Suitable for use in patch panels, floorboxes and outlet inserts of the PREMIUM series

Article no.:
9ZE33333
Pcs. per packing unit: 8

ELine 250® RJ45 S jack
16 x 14 x 36.9 mm (WxHxD)
Mounting depth: 40 mm

Product description
- Jack body: fully shielded
- Strain relief: metal
- Contacts: 8-pole RJ45 jack
- Short assembly time
- Suitable for use in patch panels, floorboxes and outlet inserts of the PREMIUM series

Article no.:
9ZE30001
Pcs. per packing unit: 8

ELine 250® RJ45 U jack
16 x 14 x 36.9 mm (WxHxD)
Mounting depth: 40 mm

Product description
- Jack body: shielded
- Strain relief: metal
- Contacts: 8-pole RJ45 jack
- Short assembly time
- Suitable for use in patch panels, floorboxes and outlet inserts of the PREMIUM series

Article no.:
9ZE30009
Pcs. per packing unit: 8

Outlets and patch panels

ELine™ PREMIUM triple outlet insert
50 x 50 x 30.5 mm (WxHxD)
Mounting depth: 25 mm
Inclination: 62°

Product description

- Without components
- Suitable for mounting in parapet ducts and for surface mounting, concealed mounting and many underfloor systems
- M4 thread for earth connection
- Dust protection cover
- Delivery without cover frame
- For up to 3 jacks
- Compatible with ELine 1200® EC7, ELine 500® RJ45 S, ELine 250® RJ45 S, ELine 250® RJ45 U
- Pure white, RAL 9010

Article no.:
9ZE30010
Pcs. per packing unit: 8

Other outlets see VarioLine®

ELine™ PREMIUM dual outlet insert
50 x 50 x 30.5 mm (WxHxD)
Mounting depth: 25 mm
Inclination: 62°

Product description

- Without components
- Suitable for mounting in parapet ducts and for surface mounting, concealed mounting and many underfloor systems
- M4 thread for earth connection
- Dust protection cover
- Delivery without cover frame
- For up to two modules
- Compatible with ELine 1200® EC7, ELine 500® RJ45 S, ELine 250® RJ45 S, ELine 250® RJ45 U
- Pure white, RAL 9010

Article no.:
9ZE30041
Pcs. per packing unit: 8

Other outlets see VarioLine®

ELine™ PREMIUM patch panel, 1 RU, 48 ports (RJ45/EC7)
483 x 1 RU x 98 mm (WxHxD)

Product description

- Without components, for a maximum of 48 jacks (including mixed media): ELine 1200® EC7, ELine 500® RJ45 S, ELine 250® RJ45 S, ELine 250® RJ45 U
- Front panel light grey, RAL 7035
- Snap-in assembly
- Mounting clip not required
- Traction relief
- Earth connection

Article no.:	Colour
9ZE30052	light grey, RAL 7035
9ZE30047	black, RAL 9005
Pcs. per packing unit: 1	

ELine™ PREMIUM 1 RU, 24 ports (RJ45/EC7)
483 x 1 RU x 98 mm (WxHxD)

Product description

- Without components, for a maximum of 24 jacks (including mixed media): ELine 1200® EC7, ELine 500® RJ45 S, ELine 250® RJ45 S, ELine 250® RJ45 U
- Front panel light grey, RAL 7035
- Snap-in assembly
- Mounting clip not required
- Traction relief
- Earth connection

Article no.:	Colour
9ZE30002	light grey, RAL 7035
9ZE30046	black, RAL 9005
Pcs. per packing unit: 1	

Trunk and CP cables

ELine™ RJ45
Trunk and CP cables

Product description

- Trunk and CP cable is based on an F10-120 S/F flex cable and is equipped with an RJ45 SmartLock plug and an ELine 500® RJ45 S jack. The high-quality components used result in a product which meets the requirements of Class E_A according to ISO/IEC 11801 for 10 Gigabit Ethernet.
- Ready-made cable F10-120 S/F flex
  A side: RJ45 SmartLock
  B side: ELine 500® RJ45 S jack

Article no.:	Length
9A021195	5 m
9A021183	10 m
9A021198	15 m
9A021200	20 m
9A021202	25 m
9A021268	30 m
Pcs. per packing unit: 1	

Other lengths available on request

Other accessories

ELine 1200® EC7, ELine 500® RJ45 S and ELine 250® RJ45

ELine™ PREMIUM mini patch panel
122 x 35 x 100 mm (WxHxD)

Product description

- Housing: closed, sheet steel
- Without components
- For mounting on walls, floors, ceilings, furnishings and top hat rails and in industrial environments
- For a maximum of 6 jacks ELine 1200® EC7, ELine 500® RJ45 S, ELine 250® RJ45 S/U
- Jacks fixed via snap-in springs
- Pure white, RAL 9010

Article no.:
9ZE30045
Pcs. per packing unit: 1

ELine™ PREMIUM mounting clip
184 x 47 x 82 mm (WxHxD)

Product description

- For mounting ELine 250® RJ45, ELine 500® RJ45, ELine 1200® EC7 jacks to existing patch panels/ outlets from the old ELine™ range
- Pure white, RAL 9010
- Hinged dust protection cover

Article no.:
9ZE30021
Pcs. per packing unit: 8

ELine™ PREMIUM patch panel, 1 RU
485 x 44 x 150 mm (WxHxD)
Mounting depth: 148 mm

Product description

- Without components
- For a maximum of 16 jacks ELine 1200® EC7, ELine 500® RJ45 S, ELine 250® RJ45 S, ELine 250® RJ45 U jacks for mounting with an adapter clip (article no.: 9ZE30006)
- 1 RU
- Light grey, RAL 7035

Article no.:
9ZE10127
Pcs. per packing unit: 1

ELine™ PREMIUM patch panel, 2 RU
485 x 88 x 150 mm (WxHxD)
Mounting depth: 148 mm

Product description

- Without components
- For a maximum of 32 jacks ELine 1200® EC7, ELine 500® RJ45 S, ELine 250® RJ45 S, ELine 250® RJ45 U jacks for mounting with an adapter clip (article no.: 9ZE30006)
- 2 RU
- Light grey, RAL 7035

Article no.:
9ZE10128
Pcs. per packing unit: 1

ELine 1200® EC7, ELine 500® RJ45 and ELine 250® RJ45

ELine™ PREMIUM assembly tool

Product description

- For simple, safe connection of the jacks
  ELine 1200® EC7,
  ELine 500® RJ45 S,
  ELine 250® RJ45 S,
  ELine 250® RJ45 U

Article no.:
9ZE30007
Pcs. per packing unit: 1

Floorbox solutions

ELine™ device adapter

Product description

- For mounting in ELine™ floorbox insert (for Ackermann UF system GES – other underfloor systems on request!)
- Mass connection/Earth connection
- Integrated strain relief
- Adapter made of 1.5 mm sheet steel
- Surfaces electroplated
- Device adapter for:
  - 1 – 3 pcs. ELine 1200® EC7
  - 1 – 3 pcs. ELine 500® RJ45 S
  - 1 – 3 pcs. ELine 250® RJ45 S
  - 1 – 3 pcs. ELine 250® RJ45 U

Article no.:
9ZE60006
Pcs. per packing unit: 1

ELine™ floorbox insert

Product description

- GES 6 insert for a maximum of 2 mounting plates
- For mounting in Ackermann floorbox GES 6 and TEHALIT floorbox
- Device cup and locking device made of 1.5 mm sheet steel
- Surfaces powder-coated deep black, RAL 9005
- Self-adhesive marking strips for marking as required
- Adjustable cable strain relief for up to 9 individual cables/copper. (The cable strain relief is not part of the scope of delivery)
- Dust protection cover for fiber optical (optional)
- Optionally available mounting plates:
  - FLine® 4 x SC duplex
  - FLine® 4 x E2,000/SC/MTRJ
  - ELine™ device adapter
  - Dummy cover
- The following system accessories are available: Separate strain relief 45 mm and 64.5 mm

Article no.:
9ZE60001
Pcs. per packing unit: 1

ELine™ floorbox insert

Product description

- GES 6 insert for a maximum of 3 mounting plates
- For mounting in Ackermann floorbox GES 6 and TEHALIT floorbox
- Device cup and locking device made of 1.5 mm sheet steel
- Surfaces powder-coated deep black, RAL 9005
- Self-adhesive marking strips for marking as required
- Adjustable cable strain relief for up to 9 individual cables/copper. (The cable strain relief is not part of the scope of delivery)
- Dust protection cover for fiber optical (optional)
- Optionally available mounting plates:
  - FLine® 4 x SC duplex
  - FLine® 4 x E2,000/SC/MTRJ
  - ELine™ device adapter
  - Dummy cover
- The following system accessory is available: Separate strain relief 45 mm and 64.5 mm

Article no.:
9ZE60002
Pcs. per packing unit: 1

The ELine™ NOVUM system

ELine 600® GG45
+ adapter clip

ELine™ wall outlet insert GG45/MLU
(86 x 86 mm)

ELine 250® RJ45 MLU
Cat. 6, unshielded

ELine™ NOVUM

The ELine™ NOVUM product family provides a shielded Cat. 6 or Cat. 7 system and an unshielded Cat. 6 system which fits into many wall outlets complying with international standards thanks to its Keystone dimensions. The shielded and the unshielded jack can also be integrated into the VarioLine® range of wall outlets. This product family thus provides the option of building up a Class E system whose electrical characteristics give it good reserves with regard to the requirements of EN50173, 2nd Edition, in unshielded technology with excellent value for money.

ELine 600® GG45 – now up to 1,000 MHz

Optimization of the GG45 connector system: the only standardized downwards compatible Category 7 plug face according to IEC 60603-7-71 already complies with the key values of Class F_A to be standardized in the future. The present draft standard provides for a bandwidth of 1 MHz to 1,000 MHz for this class. Its design is optimized for high frequencies, thus equipping this connector for future demands made on a channel, even in the ‚worst case' design, the 4-connector channel.

The GG45 also proves it has a secure future in RJ45 operation by providing sufficient performance for transmitting the protocol of 10 GbE according to IEEE 802.3an.

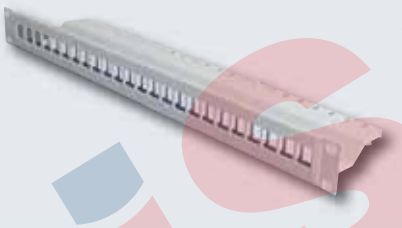
Assembly is easy due to the MegaLine® system cable SY23

The system is rounded off by the high-performance system data cable SY23 (AWG23) from LEONI Kerpen which was specially developed for chamber plugs and is particularly suitable for the GG45. This is achieved via very tight foils covering the twisted pairs, making the fitting of the GG45 plug considerably easier and allowing the fitter to install it in a much shorter time. Summing up, it can be said that the GG45 connector system is very well-equipped for future applications, thus providing a high degree of investment protection. For the fitter, the combination of GG45 jack and MegaLine® system cable saves time and offers advantages for cable assembly which lead to good, repeatable results in the acceptance tests.

ELine™ wall outlet insert GG45/MLU (45 x 45 mm)

ELine™ wall outlet insert GG45/MLU (80 x 80 mm)

ELine™ 24 port/1 RU panel



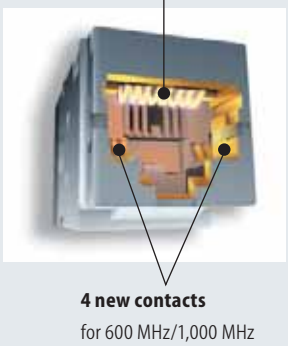
	Class F / Cat. 7		Class E / Cat. 6 unshielded	
	ELine 600® GG45	Article no.	ELine 250® RJ45 MLU	Article no.
MegaLine® cable	SY23	7KS01568	E2-30 U/U	
ELine™ jack	GG45 (keystone)	9ZE20001	MLU (keystone)	9ZK00022
ELine™ outlet	German 50 x 50 mm 2 p	9ZE20005	50 x 50 mm 45 x 45 mm Frame 80 x 80 mm German style Frame 80 x 80 mm French style Frame 86 x 86 mm UK style	9ZE80004 9ZE80003 9ZE80005 9ZE80013 9ZE80006
ELine™ panel (keystone)	19", 1 RU, 24 ports	9ZK00024	19", 1 RU, 24 ports	9ZK00024
ELine™ patch cord (selection)	GG45-GG45 1 m GG45-GG45 2 m GG45-GG45 3 m GG45-GG45 5 m GG45-GG45 10 m	9KN01010 9KN01020 9KN01030 9KN01050 9KN01100	RJ45-RJ45 1 m RJ45-RJ45 2 m RJ45-RJ45 3 m RJ45-RJ45 5 m RJ45-RJ45 10 m	9A050028 9A050030 9A050032 9A050034 9A050036

ELine 600® GG45 – two in one

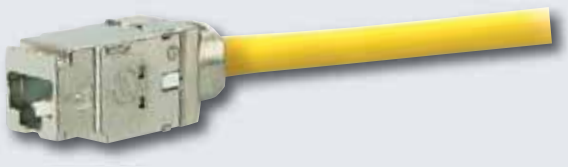
Cat. 6 and Cat. 7 now up to 1,000 MHz

ELine 600® GG45: the concept

At the heart of the GG45 concept is the snap-in connector. For the development of the GG45, four new contacts for Cat. 7 transmission were added to the RJ45. These are activated via a switch mechanism in the jack. The GG45 jack thus has the first ever switching mechanism for passive cabling.



In conjunction with the GG45 plug, transmission up to 1,000 MHz is possible on the outer 4 contacts with a suitable cable. This transmission bandwidth ensures that applications of the future F_A class can also be transmitted. The GG45 plug activates the switch via a spacer on the front which activates the 4 new contacts responsible for Cat. 7 transmission.



Two in one: Cat. 6 and Cat. 7!

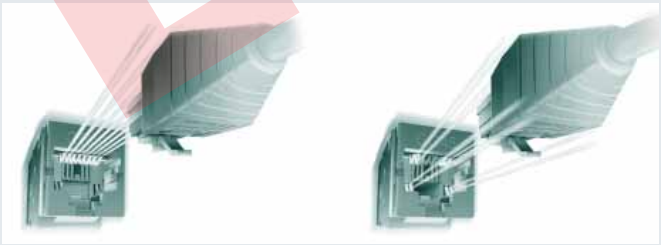
As a two-in-one connector (complete RJ45 and new 600 MHz interface), GG45 is fully backward-compatible and meets all requirements of Categories 5, 6 and 7. If you invest in ELine 600® GG45 for Class E and F today, considerable savings are guaranteed in comparison with other Class F cabling: For patch and work area purposes, you can for example continue to use the conventional RJ45 patch cords/work area cords. If necessary, you can then successively invest in Category 7 patch cords/work area cords.

A secure future and backward compatibility!

ELine 600® GG45 allows economical migration from Cat. 5e and 6 to Cat. 7 by simply replacing the patch cords. This makes the decision for later Class F cabling a "just-in-time" investment: the performance is not paid for until it is required!

Class E

Class F



When the RJ45 is snapped in, the usual 8 contacts are activated and 100, 250 or 500 MHz are transmitted depending on the cable used. The integrated switch is extremely robust and reliable mechanically. Even after over 1,500 plug-in cycles (RJ45 onto new contacts), there is virtually no wear on the switch. The RJ45 leaves no plastic deposits in the jack and does not affect performance in any way.

Compatibility matrix

Jack	Plug	Cable	Performance of channel
GG45	GG45	1,000 MHz	1,000 MHz
GG45	GG45	500 MHz	500 MHz
GG45	RJ45	500 MHz	250/500 MHz (depending on quality of RJ45)
RJ45	GG45	600 MHz	Not compatible

Flexibility of use – only with panels and outlets of the NOVUM series!

The choice is yours: The ELine 600® GG45 jack can be mounted into the specially designed GG45 patch panel and in outlet inserts – or integrated into the NOVUM series via an adapter clip.

GG45 is a registered trademark of Nexans HQ, Paris

Easy assembly in standard environments

The GG45 is integrated into standard technology and can be used with standard components like a standard cover frame and standard floorboxes. The installation is based on existing technology and can be used like Cat. 5 and Cat. 6 installations.
The EMC covers on the back of the connector ensure optimum EMC protection via 360° shielding.
With the MegaLine® SY23 (AWG 23) system cable, LEONI Kerpen offers a system cable specially developed for this connector, thus making the connector considerably easier to install.

Optimum performance – certified

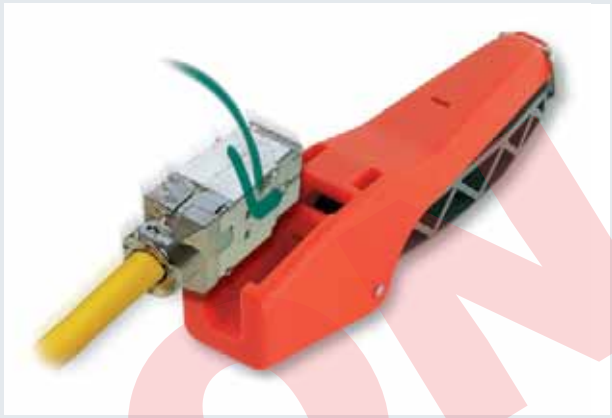
Measurements by the "Gesellschaft für Hochfrequenztechnik" GHMT (association high-frequency measuring technology) prove the excellent electrical performance of ELine 600® GG45 systems for Class E and F. Even in the worst-case configuration with 4 connectors, the system provides real Cat. 6 and Cat. 7 respectively and high NEXT reserves.

Class F and multimedia

The GG45 is at present designed for connecting information technology at the workplace. The concept will be expanded in future to include additional products in order to allow multimedia applications.

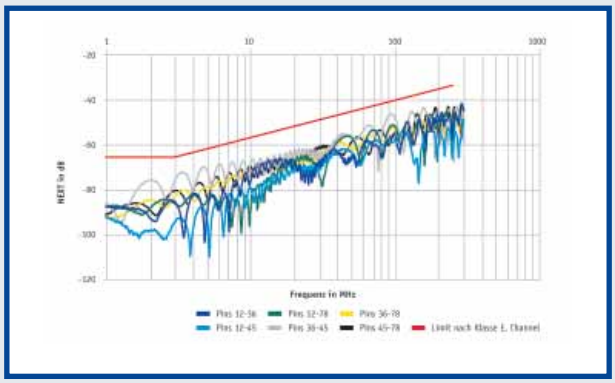
Conclusion:

The ELine 600® GG45 cabling system offers considerable advantages and potential savings:
When you first take it into operation, you can connect reasonably priced RJ45 patch cords to the GG45 jack. If more performance is expected of the LAN in later years, you can upgrade the system to a Class F system by simply replacing the RJ45 patch cords by GG45 patch cords. The advantage of this upgrading method is that it can be carried out by the network operator himself.

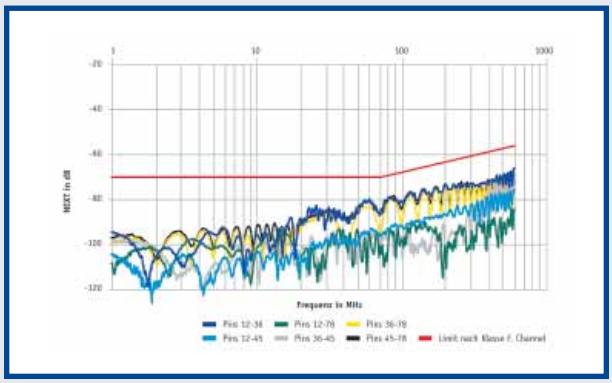


The purchase cost is reduced via "just-in-time" investments (work area cords). And you get the security which only a product standardised worldwide provides!
Excellent electrical performance is guaranteed, even in worst case configurations.
A cabling system remains in a building for an average of 15 years. It is impossible to foresee today what new demands will be made on networks during this period. If it's economy and a secure future you're looking for, you should invest in Class F right away.

Today we recommend that you invest in ELine 600® GG45 for a Class E and F cabling, for example in conjunction with the MegaLine® SY23 GG45 system cable!



Class E



Class F

Technical data

Compatible outlets/panels etc.

- ELine™ NOVUM series (see system overview on Page 114 – 115) and ELine 600® GG45

Category

- Mode 1: Cat. 6 IEC 60603-7-4 RJ45 up to 250 MHz
- Mode 2: Cat. 7 IEC 60603-7-7 up to 600 MHz

Jack type

- GG45, Cat. 7 – backward-compatible to RJ45 plug connectors
- Article number: 9ZE20001
- Connecting technology: punch-down, gas-tight IDC

System cabel

- recommended system cable:
  MegaLine® SY23
  Article number: 7KS01568

Certificate

- GHMT certificate for RJ45 Mode Category 6/Class E
- GHMT certificate for GG45 Mode Category 7/Class F

Zertifikat

Jack, outlets and patch panels

Cat. 6/7 – 250/600 MHz

ELine 600® GG45 jack (individual module)
17 x 20 x 42 mm (WxHxD)
Mounting depth: 45 mm

Product description

- Snap-in jack for use in panels/ outlet inserts of the following series:
  ELine 600® GG45 or NOVUM via adapter clip
- Incl. keystone clip

Article no.:
9ZE20001
Pcs. per packing unit: 8

ELine™ NOVUM patch panel, 24 ports
483 mm (= 19") x 44 mm x 150 mm (WxHxD)

Product description
For a maximum of

- 24 x GG45 or
  24 x RJ45 MLU
  or mixed media
- Front panel:
  light grey, RAL 7035
  black, RAL 9005
- Extremely easy to mount
- Traction relief on back
- Can be earthed via screw connection

Article no.:	Colour
9ZK00024	light grey, RAL 7035
9ZK00025	black, RAL 9005
Pcs. per packing unit: 1	

ELine 600® GG45 dual outlet insert, long
50 x 50 x 20 mm (WxHxD)
Mounting depth: 35 mm
Inclination: 45°

Product description

- Without components
- For concealed and underfloor system mounting
- Can be equipped with up to 2 ELine 600® GG45 jacks, screwless mounting of jacks
- Connecting point for an additional terminal clamp for traction relief or earthing
- Suitable for 50 x 50 frames
- Pure white, RAL 9010
- Scope of delivery: central panel (50 x 50), snap-in mounting ring, marking window (delivery without cover frame)

Article no.:
9ZE20005
Pcs. per packing unit: 8

ELine 600® GG45 dual outlet insert, short
50 x 50 x 20 mm (WxHxD)
Mounting depth: 35 mm
Inclination: 45°

Product description

- Without components
- For concealed and cable duct mounting
- Can be equipped with up to 2 ELine 600® GG45 jacks, screwless mounting of jacks
- Suitable for 45 mm round hole frames and 50 x 50 frames
- Pure white, RAL 9010
- Scope of delivery: central panel (50 x 50), snap-in mounting ring, marking window (delivery without cover frame)

Article no.:
9ZE20004
Pcs. per packing unit: 8

Patch cords and mounting tools

ELine 600® GG45 trunk and CP cable

Product description

- The ELine 600® GG45 trunk and CP cable is based on a patch cord equipped on one end with a GG45 plug to which a GG45 jack specially designed for flexible conductors can be fitted at the other end. The high-quality individual components used result in a high-performance trunk or CP cable which meets the requirements of Class F according to ISO/IEC 11801 for 10 Gigabit Ethernet
- Ready-made cable F10-120 S/F flex
  A side: GG45 plug
  B side: open end,
  suitable for GG45 socket (9ZE20013)

Article no.:	Length
9KN02050	5 m
9KN02100	10 m
9KN02150	15 m
9KN02200	20 m
9KN02250	25 m
9KN02300	30 m
Pcs. per packing unit: 1	

ELine 600® GG45 Cat. 7 patch cord/work area cord

Product description

- 4P (ML F6-90 S/F flex, 7KS70014
- A end equipped with 4-pair GG45 plug
- B end equipped with 4-pair GG45 plug
- Assignment: 1/1
- Colour of bending protection sleeve GG45/GG45: black
- Application: Cat. 7 services

Article no.:	Length
9KN01010	1.0 m
9KN01020	2.0 m
9KN01030	3.0 m
9KN01050	5.0 m
Pcs. per packing unit: 1	

ELine 600® GG45 assembly tool

Product description

- Assembly tool for simple, safe moulding of the ELine 600® GG45 jack

Article no.:
9ZE20006
Pcs. per packing unit: 1

ELine 250® MLU

with flexible NOVUM technology

The universal NOVUM technology is a concept for the flexible combination of ELine™ jacks of various different performance levels with the relevant wall outlets and panels of the NOVUM series.

The easiest installation imaginable and good performance in conjunction with MegaLine® data cables guarantee optimum value for money.

Technical data

Compatible outlets/panel etc.

- ELine™ outlet inserts MLS/MLU
- ELine™ panel MLS/MLU

Jack type

- RJ45, Cat. 6 (mated) for 250 MHz performance
- Shielded (ELine 250® MLS, Article number: 9ZK00022)
- Connection method: IDC 110 type punch-down, gas-tight
- Recommended conductors: AWG 24/AWG 23
- Colour coding according to EIA/TIA-568A and -568B

Certificates

- ETL certified according to Cat. 6 (mated link)
- UL certified according to EIA/TIA-568-A-5 (UL/cUL 1863 listed)

Jacks, patch panels and outlets

Cat. 6 – 250 MHz

ELine 250®
RJ45 MLU jack, unshielded

Product description

- Unshielded
- 8–pole RJ45 jack
- Suitable for use in patch panels and outlet inserts of the NOVUM series
- Category 6

Article no.:
9ZK00022
Pcs. per packing unit: 1

ELine™ NOVUM
patch panel, 24 ports
483 mm (= 19") x
44 mm x 150 mm (WxHxD)

Product description

For a maximum of

- 24 x ELine 600® GG45 or 24 x ELine 250® RJ45 MLU or mixed media
- Front panel: light grey, RAL 7035 black, RAL 9005
- Extremely easy to mount
- Traction relief on back
- Can be earthed via screw connection

Article no.:	Colour
9ZK00024	light grey, RAL 7035
9ZK00025	black, RAL 9005
Pcs. per packing unit: 1	

VarioLine®
dual wall outlet insert
50 x 50 mm NOVUM

Product description

- Wall outlet insert for installation in usual 50 x 50 mm cover frames
- Integrated hinged dust protection covers
- Two parts (outlet insert, jack insert)
- Delivery without cover frame
- Can be equipped with a maximum of 2 jacks
  ELine 1200® EC7
  ELine 500® RJ45 S
  ELine 250® RJ45 S
  ELine 250® RJ45 U or
  a combination of two systems
- Frame width: 45 mm
- Frame height: 45 mm
- Marking: via marking field
- Colour: pure white; RAL 9010
- Body of housing: plastic
- Scope of delivery:
  central panel (50 x 50 mm)
  snap-in mounting ring screws

Article no.:
9ZE80004
Pcs. per packing unit: 8

VarioLine® cover frame
80 x 80 mm NOVUM

Product description

- Plastic cover frame 80 x 80 mm with rectangular opening 50 x 50 mm
- For integrating VarioLine® inserts with the dimensions 50 x 50 mm
- Colour: pure white; RAL 9010
- Dimensions: 80 x 80 mm

Article no.:
9ZE80005
Pcs. per packing unit: 8

Outlets

VarioLine®
dual wall outlet insert
45 x 45 mm NOVUM
Mounting depth: 42 mm
Inclination: 28°

Product description

- Wall outlet insert for installation in usual French style cover frames
- Integrated hinged dust protection covers
- Two parts (outlet insert, jack insert)
- Delivery without cover frame
- Can be equipped with a maximum of 2 jacks
  ELine 1200® EC7
  ELine 500® RJ45 S
  ELine 250® RJ45 S
  ELine 250® RJ45 U or
  a combination of two systems
- Frame width: 45 mm
- Frame height: 45 mm
- Marking: via marking field
- Colour: pure white; RAL 9010
- Body of housing: plastic

Article no.:
9ZE80002
Pcs. per packing unit: 8

VarioLine® adapter
45 x 45 mm to 50 x 50 mm

Product description

- For adapting 45 x 45 mm VarioLine® wall outlets in UK style frames (86 x 86 mm)
- Plastic
- Colour: pure white; RAL 9010

Article no.:
9ZE80014
Pcs. per packing unit: 8

VarioLine® frame
(UK style)

Product description

- Plastic cover frame
  86 x 86 mm with rectangular opening 50 x 50 mm
- For integrating VarioLine® adapters 50 x 50 mm to 45 x 45 mm (9ZE80014)
- Colour: pure white; RAL 9010
- Dimensions: 86 x 86 mm

Article no.:
9ZE81000
Pcs. per packing unit: 8

VarioLine® cover frame
(French style)
80 x 80 mm NOVUM

Product description

- Plastic cover frame
  80 x 80 mm with rectangular opening 45 x 45 mm
- For integrating VarioLine® inserts with the dimensions 45 x 45 mm
- Colour: pure white; RAL 9010
- Dimensions: 80 x 80 mm

Article no.:
9ZE80013
Pcs. per packing unit: 8

The ELine™ FIXUM system

ELine 250® RJ45 FS
panel 24 ports Cat. 6

ELine 250® RJ45 FU
panel 24 ports Cat. 6

ELine 250® RJ45 FS/FU
Dual wall outlet Cat. 6

ELine 10™ RJ45 FU
telephone panel
25 ports Cat. 3

ELine 250® RJ45 FU
telephone panel
50 ports Cat. 3

ELine 250® RJ45 FS and ELine 250® RJ45 FU
Hard-wired Cat. 6/Cat. 3 solution

ELine 250® RJ45 FS and ELine 250® RJ45 FU offer good performance with reserves exceeding the Cat. 6 specification in the channel and in the permanent link. In addition, the components are manufactured according to the well-known LSA method, making them extremely easy to mount.

ELine 250® RJ45 FS data outlet

Category 6

Description
Data outlet for transmitting analog and digital speech, image and data signals. Performance features according to Class E up to 250 MHz according to ISO/IEC 11801:2002 and EN 50173-1:2002. Cable entry also possible in standard mounting cups if the prescribed bending radii are complied with. Quick and easy installation.

Structure:
Housing: full metal; zinc die-cast
Shielding: large-surface 360° shield connection
RJ45 jack: EN 60603-7 (shielded)

Design options: combinable with UAE covers from all usual switch manufacturers

Wiring: 1-2. 3-6. 4-5. 7-8

Electrical values: Cat. 6

Connection:
Cable: LSA connection
Jack: RJ45 shielded (EN 60603-7)

Standards: ISO/IEC 11801:2002. EN 50173-1:2002. IEC 60603-7-5/Ed. 1.0 (Draft 05.2002)

ELine™ data outlet

Article no.	Name	Colour*
9A410000	ELine 250® RJ45 FS (Cat. 6) incl. cover without frame	RAL 1013
9A410001	ELine 250® RJ45 FS (Cat. 6) incl. cover without frame	RAL 9010

* Other colours available on request

ELine™ data outlet accessories

Article no.	Name	Colour*
9A410002	ELine™ UP cover frame single	RAL 1013
9A410003	ELine™ UP cover frame single	RAL 9010
9A410004	ELine™ UP cover frame dual	RAL 1013
9A410005	ELine™ UP cover frame dual	RAL 9010
9A410087	ELine™ housing for surface mounting 40 mm incl. UP cover frame single	RAL 1013
9A410086	ELine™ housing for surface mounting 40 mm incl. UP cover frame single	RAL 9010
9A410089	ELine™ spacer frame for housings for surface mounting single 10 mm	RAL 1013
9A410088	ELine™ spacer frame for housings for surface mounting single 10 mm	RAL 9010

* Other colours available on request

ELine 250® RJ45 FS patch field

Category 6

Description
Patch field for transmitting analog and digital speech, image and data signals. Performance features according to Class E up to 250 MHz according to ISO/IEC 11801:2002 and EN 50173-1:2002. The separate fixing of the individual data pairs allows extremely rapid assembly.

Structure:	Housing:	full metal; lid fastening and shield contacting via 3 screws
	Dimensions:	19"; 1 RU
	Components:	three basic circuit boards
		8 LSA strips per circuit board
		8 RJ45 jacks (shielded) per circuit board
	Shielding:	large-surface 360° shield connection
	Strain relief:	via cable clips
	RJ45 jack:	EN 60603-7 (shielded)
Wiring:	1-2. 3-6. 4-5. 7-8	
Electrical values:	Cat. 6	
Connection:	Cable:	LSA connection
	Jack:	RJ45 shielded (EN 60603-7)
Standards:	ISO/IEC 11801:2002. EN 50173-1:2002. IEC 60603-7-5/Ed. 1.0 (Draft 05.2002)	

ELine™ patch field

Article no.	Name	Colour
9A610029	ELine 250® RJ45 FS (Cat. 6)	RAL 7035

ELine 250® RJ45 FU data outlet

Category 6




Description

Data outlet for transmitting analog and digital speech, image and data signals according to Class E up to 250 MHz according to ISO/IEC 11801:2002 and EN 50173-1:2002. Cable entry also possible in standard mounting cups if the prescribed bending radii are complied with. Quick and easy installation.

Structure: Housing: full metal; zinc die-cast
RJ45 jack: EN 60603-7 (unshielded)

Design options: combinable with UAE covers from all usual switch manufacturer

Wiring: 1-2. 3-6. 4-5. 7-8

Electrical values: Cat. 6. Class E

Connection: Cable: LSA connection
Jack: RJ45 unshielded (EN 60603-7)

Standards: ISO/IEC 11801:2002. EN 50173-1:2002

ELine™ data outlet UTP

Article no.	Name	Colour*
9A410008	ELine 250® RJ45 FU (Cat. 6) UTP incl. cover without frame	RAL 1013
9A410009	ELine 250® RJ45 FU (Cat. 6) UTP incl. cover without frame	RAL 9010

* Other colours available on request

ELine™ data outlet UTP Accessories

Article no.	Name	Colour*
9A410002	ELine™ UP cover frame single	RAL 1013
9A410003	ELine™ UP cover frame single	RAL 9010
9A410004	ELine™ UP cover frame dual	RAL 1013
9A410005	ELine™ UP cover frame dual	RAL 9010
9A410087	ELine™ housing for surface mounting 40 mm incl. UP cover frame single	RAL 1013
9A410086	ELine™ housing for surface mounting 40 mm incl. UP cover frame single	RAL 9010
9A410089	ELine™ spacer frame for housing for surface mounting single 10 mm	RAL 1013
9A410088	ELine™ spacer frame for housing for surface mounting single 10 mm	RAL 9010

* Other colours available on request

ELine 250® RJ45 FU patch field

Category 6

Description
Patch field for transmitting analog and digital speech, image and data signals. Performance features according to Class E up to 250 MHz according to ISO/IEC 11801:2002 and EN 50173-1:2002. The separate fixing of the individual data pairs allows extremely rapid assembly.

Structure:	Housing:	full metal; lid fixed via 3 screws
	Dimensions:	19"; 1 RU
	Components:	three basic circuit boards
		8 LSA strips per circuit board
		8 RJ45 jacks (unshielded) per circuit board
	Strain relief:	via cable clips
	RJ45 jack:	EN 60603-7 (unshielded)
Wiring:	1-2. 3-6. 4-5. 7-8	
Electrical values:	Cat. 6. Class E	
Connection:	Cable:	LSA connection
	Jack:	RJ45 unshielded (EN 60603-7)
Standards:	ISO/IEC 11801:2002. EN 50173-1:2002	

ELine™ patch field

Article no.	Name	Colour*
9A610004	ELine 250® RJ45 FU (Cat. 6) UTP Patch field ELine 250® RJ45 FU	RAL 9011

* Other colours available on request

ELine 10™ RJ45 FU patch field

Category 3

Description

Patch field for transmitting analog and digital (ISDN) telephone signals. Performance features according to Class C (ISO/IEC 11801:2002 and EN 50173-1:2002). A slit plastic cable duct ensures clean and straightforward wire guidance. Telephone cables up to 50 DA/100 DA can be connected to the patch field. The use of high-quality RJ45 jacks equipped with gold-plated spring contacts ensuring high contact reliability guarantee a long life and excellent electrical characteristics.

Structure:
Housing: full metal
Dimensions: 19"; 1 RU
Components: five basic circuit boards
5 LSA strips and 5 RJ 45 jacks (50 DA) per circuit board
10 LSA strips and 10 RJ 45 jacks (100 DA) per circuit board
RJ45 jack: EN 60603-7 (unshielded)

Wiring: 2 pairs 3-6. 4-5

Connection:
Cable: LSA connection
Jack: RJ45 unshielded (EN 60603-7)

Standards: ISO/IEC 11801:2002. EN 50173-1:2002

ELine™ Patch field

Article no.	Name	Colour
9A610001	ELine 10™ RJ45 FU UTP (Cat. 3). 25 ports	RAL 7035
9A610002	ELine 10™ RJ45 FU UTP (Cat. 3). 50 ports	RAL 7035
9A610012	ELine 10™ RJ45 FU UTP (Cat. 3). 25 ports	RAL 9011
9A610006	ELine 10™ RJ45 FU UTP (Cat. 3). 50 port	RAL 9011

MegaLineNet® patch cord TERA up to 1,000 MHz

Copper patch cord (shielded) with coloured moulded bending protection sleeve

Description:

Depending on the requirements. the patch and work area cords are equipped with TERA or RJ45 plugs. The RJ45 plug has a moulded bending protection sleeve. All cable types used in the patch cord have been adapted to the relevant applications. The cable of F10-120 S/F flex type used is designed for a bandwidth of up to 1 GHz in the case of 4-pair assignment.

Applications:

	Applications:	Wiring
	10BASE-T / 100BASE-T2	TERA 2 pairs on RJ45
	Token-Ring	TERA 2 pairs on RJ45
	ISDN	TERA 2 pairs on RJ45
	Telephone connection cable	TERA 1 pair on RJ11
	Telephone connection cable	TERA 1 pair on RJ45
	Any application	TERA 4 pairs on RJ45
	Connecting cable 2 pairs	TERA on TERA
	Connecting cable 2 pairs	TERA on TERA

TERA 2 pairs on RJ45* (F10-120 S/F flex)

10 BASE-T/100BASE-T2		Token-Ring		ISDN	
Article no.	Length	Article no.	Length	Article no.	Length
9A040000	1.0	9A040006	1.0	9A040012	1.0
9A040001	2.0	9A040007	2.0	9A040013	2.0
9A040002	3.0	9A040008	3.0	9A040014	3.0
9A040003	5.0	9A040009	5.0	9A040015	5.0

TERA 4 pairs on RJ45* (F10-120 S/F flex)

4 pairs	
Article no.	Length
9A040039	1.0
9A040040	2.0
9A040041	3.0
9A040042	5.0

TERA 1 pair on RJ11RJ45* (326 flex)

Telephone connection		Telephone connection	
Article no.	Length	Article no.	Length
9A040017	1.0	9A040022	1.0
9A040018	2.0	9A040023	2.0
9A040019	3.0	9A040024	3.0
9A040045	5.0	9A040055	5.0

TERA on TERA* (F10-120 S/F flex)

Telephone connection		Telephone connection	
Article no.	Length	Article no.	Length
9A040026	1.0	9A040032	1.0
9A040027	2.0	9A040033	2.0
9A040028	3.0	9A040034	3.0
9A040029	5.0	9A040035	5.0

* Other lengths and wiring versions available on request

TERA is a registered trademark of the Siemon company

MegaLineNet® patch cord RJ45 500 MHz

Patch cord RJ45/RJ45 shielded 1:1 assignment F6-90 S/F flex with coloured bending protection sleeve

Description:
The patch and work area cords 500 MHz are equipped with a shielded RJ45 plug and bending protection at both ends. The F6-90 S/F flex type cable used is suitable for transmission rates of up to 500 MHz. The pair shielding and the high-coverage copper braid as overall shield ensure excellent NEXT and impedance values. In addition to the standard versions. the cable can be equipped with various combinations of jacks and plugs in any desired length. Delivery times and prices for these special types are available on request.

Application: IEEE 802.3; 10BASE-T; 100BASE-T; 1000BASE-T; suitable for 10GBASE-T
IEEE 802.5 16 MB; ISDN; FDDI; ATM

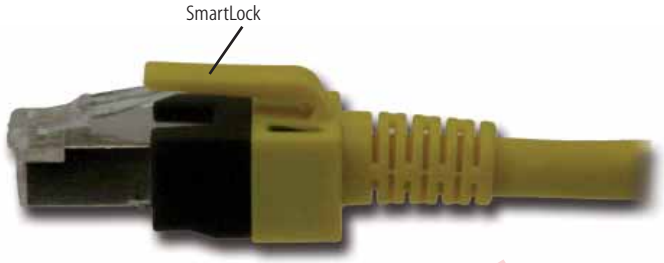
Characteristics: Self-extinguishing: IEC 60332-1-2
Halogen-free: IEC 60754-2
Minimum smoke development: IEC 61034
EMC: combined shield (pimf + braid). RJ45 plug Hirose TM21 (EN 60603-7)
Electrical values: 500 MHz

Grey (bending protection red) FRNC			
Article no.	**Length**	**Article no.**	**Length**
9A020382	0.5 m	9A020391	7.0 m
9A020383	1.0 m*	9A020392	7.5 m
9A020384	1.5 m*	9A020393	8.0 m
9A020385	2.0 m*	9A020394	9.0 m
9A020386	2.5 m	9A020395	10.0 m *
9A020387	3.0 m*	9A020396	12.0 m
9A020388	4.0 m	9A020397	15.0 m
9A020389	5.0 m*	9A020398	20.0 m

* Standard stock articles

MegaLineNet® patch cord RJ45 500 MHz

Patch cord RJ45/RJ45 shielded 1:1 assignment E5-70 S/F flex
with coloured moulded bending protection sleeve and SmartLock



Description

The patch and work area cords 500 MHz are equipped with a shielded RJ45 plug and moulded bending protection including SmartLock at both ends. The E5-70 S/F flex type cable used is suitable for transmission rates of up to 500 MHz. The pair shielding and the high-coverage copper braid as overall shield ensure excellent NEXT and return loss values. In addition to the standard versions, the cable can be equipped with various combinations of jacks and plugs in any desired length. Delivery times and prices for these special types are available on request.

Application: IEEE 802.3; 10BASE-T; 100BASE-T; 1000BASE-T; 10GBASE-T
IEEE 802.5 16 MB; ISDN; FDDI; ATM

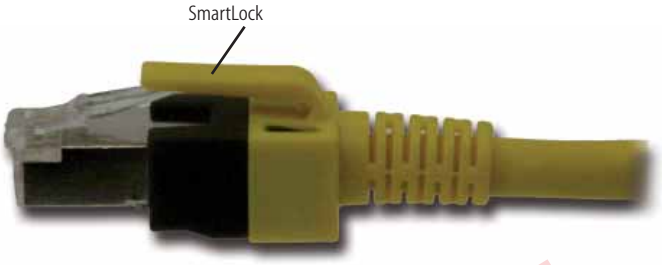
Characteristics: Self-extinguishing: IEC 60332-1-2
Halogen-free: IEC 60754-2
Minimum smoke development: IEC 61034
EMC: combined shield (pimf + braid), RJ45 plug EN 60603-7
Electrical values: 500 MHz

Length	Grey (FRNC)	Blue (FRNC)	Green (FRNC)	Yellow (FRNC)	Red (FRNC)
0.5 m	9A021132	9A021152	9A021162	9A021142	9A021172
1.0 m	9A021133*	9A021153*	9A021163*	9A021143*	9A021173*
1.5 m	9A021134	9A021154	9A021164	9A021144	9A021174
2.0 m	9A021135*	9A021155*	9A021165*	9A021145*	9A021175*
2.5 m	9A021136	9A021156	9A021166	9A021146	9A021176
3.0 m	9A021137*	9A021157*	9A021167*	9A021147*	9A021177*
4.0 m	9A021138	9A021158	9A021168	9A021148	9A021178
5.0 m	9A021139*	9A021159*	9A021169*	9A021149*	9A021179*
7.5 m	9A021140	9A021160	9A021170	9A021150	9A021180
10.0 m	9A021141	9A021161	9A021171	9A021151	9A021181

* Standard stock articles

MegaLineNet® patch cord RJ45 250 MHz

Patch cord RJ45/RJ45 shielded 1:1 assignment E2-45 S/F flex
with coloured moulded bending protection sleeve and SmartLock



Description

The patch and work area cords 250 MHz are equipped with a shielded RJ45 plug and moulded bending protection including SmartLock at both ends. The E2-45 S/F flex type cable used is suitable for transmission rates of up to 250 MHz. The pair shielding and the high-coverage copper braid as overall shield ensure excellent NEXT and return loss values. In addition to the standard versions, the cable can be equipped with various combinations of jacks and plugs. Delivery times and prices for these special types are available on request.

Application: IEEE 802.3; 10BASE-T; 100BASE-T; 1000BASE-T; 1
IEEE 802.5 16 MB; ISDN; FDDI; ATM

Characteristics: Self-extinguishing: IEC 60332-1-2
Halogen-free: IEC 60754-2
Minimum smoke development: IEC 61034
EMC: combined shield (pimf + braid), RJ45 plug EN 60603-7
Electrical values: 250 MHz

Length	Grey (FRNC)
0.5 m	9A021282
1.0 m	9A021283
1.5 m	9A021284
2.0 m	9A021285
2.5 m	9A021286
3.0 m	9A021288
4.0 m	9A021289
5.0 m	9A021290
7.5 m	9A021291
10.0 m	9A021292

* Standard stock articles

MegaLineNet® copper patch cord 300 MHz

Patch cable RJ45/RJ45 unshielded 1:1 assignment E2-30 U/U flex
with grey moulded bending protection sleeve and SmartLock

Description

The patch and work area cords 300 MHz are equipped with a shielded RJ45 plug and moulded bending protection including SmartLock at both ends. The E2-30 U/U flex type cable used is suitable for transmission rates of up to 300 MHz. The structure of the patch cable ensures excellent NEXT and return loss values. In addition to the standard versions, the cable can be equipped with various combinations of jacks and plugs in any desired length. Delivery times and prices for these special types are available on request.

Application: IEEE 802.3; 10Base-T; 100Base-T; 1000Base-T;
IEEE 802.5 16MB; ISDN; FDDI; ATM

Characteristics: Self-extinguishing: IEC 60332-1-2
Halogen-free: IEC 60754-2
Minimum smoke development: IEC 61034
RJ45 plug: EN 60603-7
Electrical values: Cat. 6

Length	Grey (FRNC)
0.5 m	9A050027
1.0 m	9A050028
1.5 m	9A050029
2.0 m	9A050030
2.5 m	9A050031
3.0 m	9A050032
4.0 m	9A050033
5.0 m	9A050034
7.5 m	9A050035
10.0 m	9A050036

Acceptance requirements: MegaLineNet®

Cabling systems

Acceptance tests for MegaLineNet® cabling systems for a channel or permanent link are conducted according to the requirements of ISO/IEC 11801 / EN 50173, 2nd Edition. Further standards related to acceptance tests (execution of tests): DIN EN 50346 and DIN EN 61935.

Channel Class F_A

Frequency/MHZ	1	16	100	250	500	600	1000
Attenuation/dB	4.0	8.0	20.3	32.5	46.7	51.4	67.6
Near-end cross-talk attenuation/dB	65.0	65.0	65.0	59.1	53.6	52.1	47.9
PS NEXT/dB	62.0	62.0	62.0	56.1	50.6	49.1	44.9
ACR-N/dB	61.0	57.0	46.1	26.6	6.9	0.7	-19.7
PS-ACR-N/dB	58.0	54.0	41.7	23.6	3.9	-2.3	-22.7
ACR-F/dB	65.0	63.3	47.4	39.4	33.4	31.8	27.4
PS-ACR-F/dB	62.0	60.3	44.4	36.4	30.4	28.8	24.4
Reflection attenuation/dB	19.0	18.0	12.0	8.0	8.0	8.0	8.0
Time delay/µs	0.580	0.553	0.548	0.546	0.546	0.545	0.545
Time delay difference/µs	0.030	0.030	0.030	0.030	0.030	0.030	0.030

Channel Class E_A

Frequency/MHZ	1	16	100	250	500
Attenuation/dB	4.0	8.1	20.8	33.8	49.3
Near-end cross-talk attenuation/dB	65.0	53.2	39.9	33.1	27.9
PS NEXT/dB	62.0	50.6	37.1	30.2	24.8
ACR-N/dB	61.0	45.1	19.2	-0.7	-21.4
PS-ACR-N/dB	58.0	42.5	16.3	-3.6	-24.5
ACR-F/dB	65.0	41.4	25.5	17.5	11.5
PS-ACR-F/dB	62.0	38.4	22.5	14.5	8.5
Reflection attenuation/dB	19.0	18.0	12.0	8.0	8.0
Time delay/µs	0.580	0.553	0.548	0.546	0.546
Time delay difference/µs	0.050	0.050	0.050	0.050	0.050

Channel Class F

Frequency/MHZ	1	16	100	250	600
Attenuation/dB	4.0	8.1	20.8	33.8	54.6
Near-end cross-talk attenuation/dB	65.0	65.0	62.9	56.9	51.2
PS NEXT/dB	62.0	62.0	59.9	53.9	48.2
ACR/dB	61.0	56.9	42.1	23.1	-3.4
PS ACR/dB	58.0	53.9	39.1	20.1	-6.4
ELFEXT/dB	65.0	57.5	44.4	37.8	31.3
PS ELFEXT/dB	62.0	54.5	41.4	34.8	28.3
Reflection attenuation/dB	19.0	18.0	12.0	8.0	8.0
Time delay/µs	0.580	0.553	0.548	0.564	0.545
Time delay difference/µs	0.030	0.030	0.030	0.030	0.030

Channel Class E

Frequency/MHZ	1	16	100	250	600
Attenuation/dB	4.0	8.3	21.7	35.9	–
Near-end cross-talk attenuation/dB	65.0	53.2	39.9	33.1	–
PS NEXT/dB	62.0	50.6	37.1	30.2	–
ACR/dB	61.0	44.9	18.2	-2.8	–
PS ACR/dB	58.0	42.3	15.4	-5.8	–
ELFEXT/dB	63.3	39.2	23.3	15.3	–
PS ELFEXT/dB	60.3	26.2	20.3	12.3	–
Reflection attenuation/dB	19.0	18.0	12.0	8.0	–
Time delay/µs	0.580	0.553	0.548	0.546	–
Time delay difference/µs	0.050	0.050	0.050	0.050	–

Acceptance tests for class F_A:

ELine 1200® EC7 / VarioKeystone® 4K7

For the acceptance test according to Class F_A, the measuring instrument must be set to a bandwidth of 1,000 MHz. Please note the setting information for the measuring instrument. Information is available from www.idealindustries.de. Make sure that the measuring adapters are connected to the measuring instrument and locked in place. Check the relevant measuring cables and make sure that they are correctly inserted. Then carry out the zero compensation of the field according to the instructions supplied with the instrument.
The detailed measuring instruction is available on request.

Standard acceptance: channel

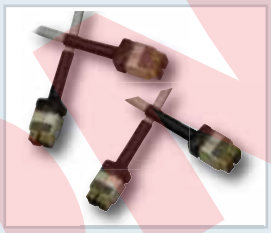
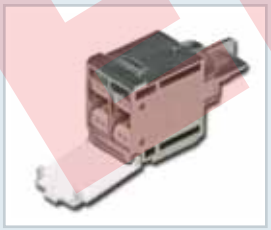
System	Recommended measuring instrument	Recommended measuring adapter	Recommended measuring cable
			
ELine 1200® EC7	**Ideal Lantek 7G** (Available from Ideal Industries)	**Measuring adapter EC7** (Available from Ideal Industries)	**Measuring cable set** (Article no.: 9ZE30057)

Acceptance tests for class F:

ELine 1200® EC7 / VarioKeystone® 4K7 / ELine 600® GG45

For the acceptance test according to Class F, the measuring instrument must be set to a bandwidth of 600 MHz. Please note the setting information for the measuring instrument. Information is available from www.idealindustries.de. Make sure that the measuring adapters are connected to the measuring instrument and locked in place. Check the relevant measuring cables and make sure that they are correctly inserted. If zero compensation is necessary, carry it out according to the instructions supplied with the instrument.
The detailed measuring instruction is available on request.

Standard acceptance: channel or permanent link

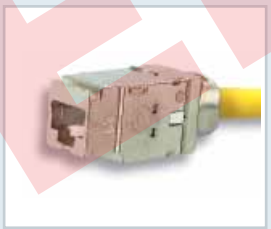
System	Recommended measuring instrument	Recommended measuring adapter	Recommended measuring cable
 **ELine 1200® EC7**	 **Ideal Lantek 7G** (Available from Ideal Industries)	 **Measuring adapter EC7** (Available from Ideal Industries)	 **Measuring cable set** (Article no.: 9ZE30057)
 **ELine 1200® EC7**	 **Fluke DTX 1800** (Available from Fluke Networks)	 **Measuring adapter EC7** (Article no.: 9ZE30038)	
 **VarioKeystone® 4K7, Cat. 7 cable plug**	 **Ideal Lantek 7G** (Available from Ideal Industries)	 **Measuring adapter EC7** (Available from Ideal Industries)	 **Measuring cable set** (Article no.: 9ZE30053)
 **ELine 600® GG45**	 **Ideal Lantek 7G** (Available from Ideal Industries)	 **Measuring adapter GG45** (Available from Ideal Industries)	 **Measuring cable set** (Available from Ideal Industries)

Acceptance tests for class E_A:

VarioKeystone® RJ45 / ELine 600® GG45 / ELine 500® RJ45 S

For the acceptance test according to Class E_A, the measuring instrument must be set to a measuring bandwidth of 500 MHz. Please note the setting information for the measuring instrument. Information is available from www.idealindustries.de. Make sure that the measuring adapters are connected to the measuring instrument and locked in place. Check the relevant measuring cables and make sure that they are correctly inserted. If zero compensation is necessary, carry it out according to the instructions supplied with the instrument. The detailed measuring instruction is available on request.

Standard acceptance: channel

System	Recommended measuring instrument		Recommended measuring cable
			
VarioKeystone® RJ45	**Ideal Lantek 7G** (Available from Ideal Industries)	**Fluke DTX 1800** (Available from Fluke Networks)	**Measuring cable set** (Article no.: 9A024414)
			
ELine 500® RJ45 S	**Ideal Lantek 7G** (Available from Ideal Industries)	**Fluke DTX 1800** (Available from Fluke Networks)	**Measuring cable set** (Article no.: 9A024414)
			
ELine 600® GG45	**Ideal Lantek 7G** (Available from Ideal Industries)	**Fluke DTX 1800** (Available from Fluke Networks)	**Measuring cable set** (Article no.: 9A024414)

Acceptance tests for class E:

ELine 250® RJ45 S / ELine 250® RJ45 U / ELine 250® MLU / ELine 250® FS/FU

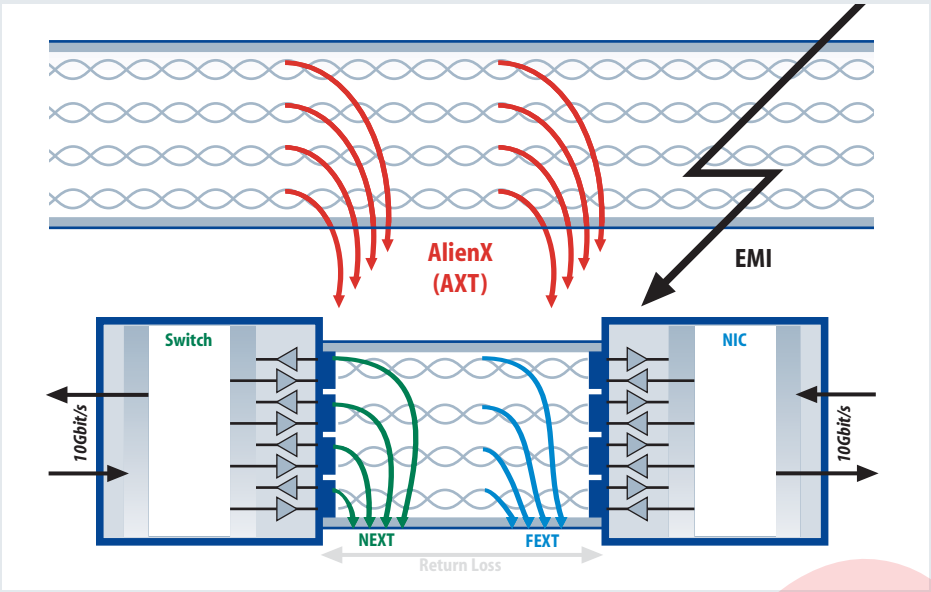
For the acceptance test according to Class E, the measuring instrument must be set to a measuring bandwidth of 250 MHz. Please note the setting information for the measuring instrument. Information is available from www.idealindustries.de. Make sure that the measuring adapters are connected to the measuring instrument and locked in place. Check the relevant measuring cables and make sure that they are correctly inserted. If zero compensation is necessary, carry it out according to the instructions supplied with the instrument. The detailed measuring instruction is available on request.

Standard acceptance: channel or permanent link

System	Recommended measuring instrument
 **ELine 250® RJ45 S**	 **Ideal Lantek 7G** (Available from Ideal Industries)
 **ELine 250® RJ45 U**	 **Fluke DSP 4300** (Available from Fluke Networks)
 **ELine 250® RJ45 MLU**	 **Fluke OMNIScanner2** (Available from Fluke Networks)

Information on other recommended measuring instrument on request

Alien Crosstalk



Transmission model and
Alien Crosstalk 10GBASE-T

Alien Crosstalk describes the undesirable mutual electrical influence between parallel links in the installation duct and in the vicinity of the patch fields.
In contrast to NEXT and attenuation, disturbance through Alien Crosstalk cannot be compensated for electronically.

The Alien Crosstalk from cable to cable or channel to channel has therefore become considerably more important from a technical point of view.
The current draft of ISO/IEC 11801 Amendment 1 (Generic cabling for customer premises) takes this into account via the relevant specifications for the new transmission classes E_A (500 MHz) and F_A (1,000 MHz).

MegaLineNet® S/FTP cablings meet the demands made on Alien Crosstalk with a high degree of reliability.
External influences from adjacent channels are prevented and suppressed simultaneously via the double shielding of the S/FTP cables and the modular shielding of the connection technology.

The Alien Crosstalk is attenuated by >100 dB (a factor of 100,000).
These characteristics are design-specific and do not change in the installation environment. IEEE 802.3an considers shielded cablings to be the preferred solution.

Alien Crosstalk arrangement by using MegaLineNet®:
6 “disturber” and 1 “victim”

Frequency MHz	Minimum PS ANEXT db	
	Class E_A, F	Class F_A
1	67.0	67.0
100	60.0	67.0
250	54.0	67.0
500	49.5	64.5
1,000	N/A	60.0

Frequency MHz	Minimum PS AACR-F db	
	Class E_A, F	Class F_A
1	67.0	67.0
100	37.0	52.0
250	29.0	44.0
500	23.0	38.0
1,000	N/A	32.0

Table 1 and 2: Demands made on PS Alien Next and PS AACR-F at selected frequencies

Coupling attenuation

The coupling attenuation assesses the overall EMC behaviour of a cable or individual link. The coupling attenuation consists of the shield attenuation and the asymmetry attenuation. It defines the measure of the reduction of electrical effects on a signal path.

If the coupling attenuation is 10.0 dB better than in Table 3 for Class E_A and F channels or 25.0 better for Class F_A channels, the values for the parameters Power Sum Alien NEXT (PS ANEXT) and Power Sum Alien ACR-F (PS AACR-F) are complied with "design-specifically", thus making it unnecessary to verify them explicitly.

Class	Frequency MHz	Minimumcoupling attenuation dB
D. E. E_A. F. F_A	$30 \leq f \leq$ NOTE 2	$80 - 20\lg(f)$
NOTE 1: calculated values of greater than 40 dB shall revert to a minimum requirement of 40 dB.		
NOTE 2: coupling attenuation is measured to 1,000 MHz but the limit applies to the upper frequency of the class being test.		

Table 3: demands made on the coupling attenuation for cabling classes D to F_A

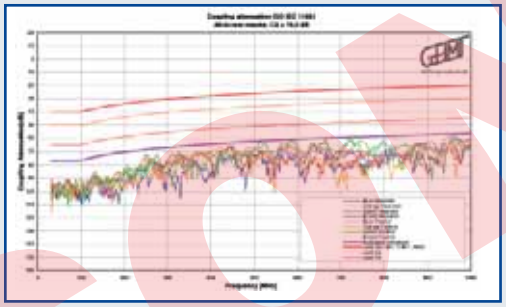
Expressed as formulae:

Coupling attenuation for Class E_A and F:
$> 90 - 20 \log(f)$, > 50 dB to 100 MHz
Coupling attenuation for Class F_A:
$> 105 - 20 \log(f)$, > 65 dB to 100 MHz

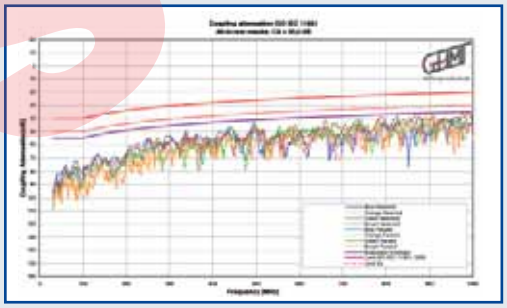
As a result of the coupling mechanisms, this connection only applies to shielded cablings and not to unshielded ones.

MegaLineNet® test results

All MegaLineNet® cabling systems with modular or individual shielding have met the extended demands made on coupling losses according to Class E_A.
ELine 1200® EC7 and VarioKeystone® 4K7 even meet the demands according to Class F_A.
It was possible to conclude the comprehensive expertises with the relevant certifications.



Coupling attenuation (Class F_A) of ELine 1200® EC7



Coupling attenuation (Class E_A) of VarioKeystone® RJ45

Fiber optic cables and systems

GigaLineNet®

GigaLine® Enhanced Fiber Technology

FLine® the system for glass fibers

VarioSmart® loose tube systems

As the degree of automation increases in industry and the information density rises in office communication, higher and higher demands are made on the transmission of analog and digital data. In this situation, conventional links based on copper cable engineering often reach the limits of their performance.

GigaLineNet® – the cables

GigaLine fiber optic cables use Enhanced Fiber technology which makes them go far beyond the specifications

Fiber optic solutions

cables and systems for LAN, MAN, WAN und SAN

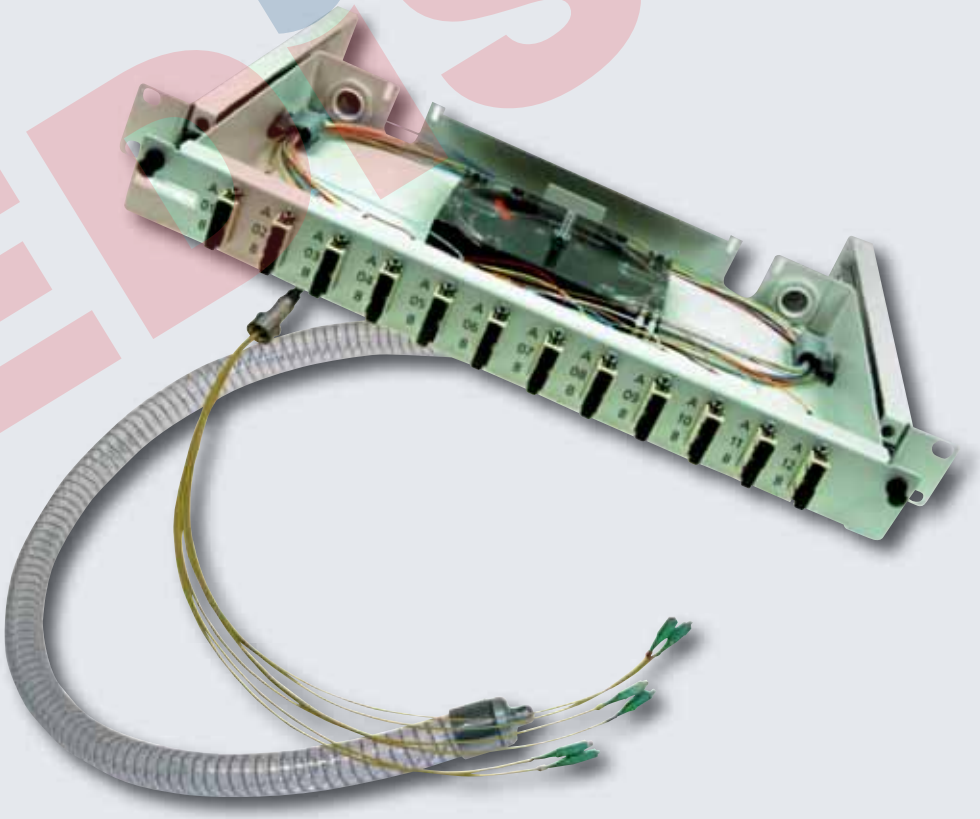
FLine® – the system for glass fibers

The constant increase in Internet and Intranet traffic, multimedia applications and the implementation of so-called SANs or Storage Area Networks in companies has led to fundamental changes in the traffic and load distribution in the networks. Also, new media require new passive network infrastructures.
On the basis of EN 50173, LEONI Kerpen has introduced the new FLine® classes "FLine® 150", "FLine® 300" and "FLine® 550" for link lengths for 10 GbE and GbE.

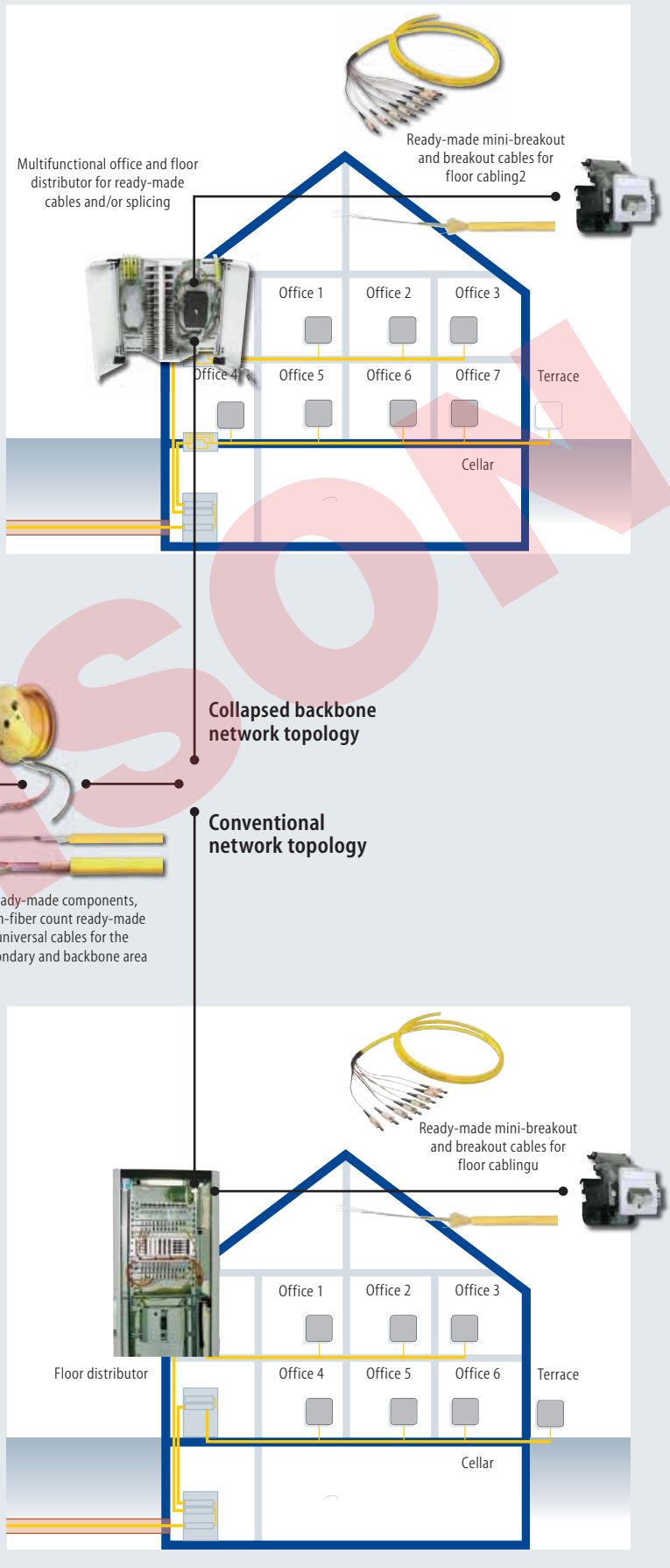
FLine® systems engineering is based on pre-terminated ready-to-connect units. The ready-made cables guarantee rapid, reliable and economic installation. The quality of the link is ensured by matching system components. The installation times are short and easy to calculate.

GigaLine® – enhanced fiber optic technology

In conjunction with multimode fibers and single-mode fibers, GigaLine® fiber optic cables offer reserves which go far beyond the specifications of the standard. Following the fiber categories OM1, OM2, OM3 and OS1 according to EN 50173, LEONI Kerpen offers the quality grades OM1e, OM2e, OM3e and OS1e with optimised transmission characteristics.



FLine® – the complete system for fiber-to-the-desk and fiber-to-the-office at maximum quality and security



GigaLine® – enhanced fiber optic technology

The problems caused by electromagnetic effects, differences in potential and operation in explosive environments require technical and economical solutions.
The use of GigaLine® fiber optic cables solves these problems more reliably than the use of conventional copper cables.

The special advantages of GigaLine® fiber optic cables make them suitable in the following cases:

- When electromagnetic effects can occur
- When reliable potential separation is required
- When low attenuation and thus long channels are necessary
- When crosstalk must not occur
- When sparks must not form (for explosive environments)
- When low weight and small dimensions are an advantage
- When increase security against tapping is required

GigaLine® means a comprehensive delivery program for fiber optic cables for virtually all applications.

Besides easy-to-assemble indoor cables with compact wire technology for the patch and floor area, universal cables for the backbone indoors and outdoors and the classical outdoor cables for LAN, MAN and WAN, LEONI Kerpen offers manufacturing options for a wide range of designs such as GigaLine® outdoor cables with a corrugated steel sheath, a steel band or SWA armour or with an additional lead covering as a protection against chemicals.

Gigabit and 10 Gigabit Ethernet: maximum demands made on the quality of the FO cabling

Improved multimode fibers for Gigabit Ethernet (“OM2e”)

Gigabit Ethernet in the backbone of structured in-house cabling is now the state of the art. The corresponding standard IEEE 802.3z was made official as early as July 1998.

As a consequence of the requirements this entails, since the beginning of this year GigaLine® has been delivered with improved multimode fibers. The process used to manufacture the fibers has been optimised in such a way that the profile of the multimode fiber is extremely precise and disturbances in the fiber core are virtually eliminated. As differential mode delay does not occur under these circumstances, mode-conditioning patch cords are not necessary.

For more than seven years now, the standard versions of GigaLine® fiber optic cables with an improved multimode fiber G50/125 have provided bandwidth/distance products of 600 MHz x km in the first window and 1,200 MHz x km in the second window as well as Gigabit Ethernet segment lengths of 750 / 2,000 m.

Improved multimode fibers for 10 Gigabit Ethernet (OM3,"OM3e")

Just a few months after publication of this standard, IEEE started work on the next stage of development with a higher speed: 10 Gigabit Ethernet.

The draft of this new 10 Gigabit Ethernet standard was ratified as early as June 2002. The official standard was also published by the IEEE in autumn 2002.

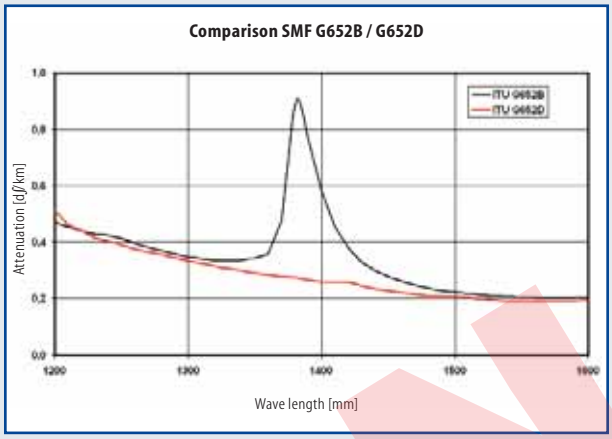
The development of a 50 µm multimode fiber for 10 GbE applications up to 300 m and optimised for 850 nm lasers was also successful. This type of fiber was not only given a standard of its own (OM3) in the 2nd Edition of the cabling standard EN 50173 – it was also included in the GigaLine® product program as early as spring 2002.

However, development continues even with the newly developed OM3 fiber. In many cases, the distances to be bridged in the backbone exceed the 300 m possible with a standard OM3 fiber. For this field of application, LEONI Kerpen has been offering GigaLine® fiber optic cables with further improved "OM3e" fibers since November 2002. These fibers offer optimum conditions for transmitting 10 GbE at segment lengths of up to 550 m. This allows the economical implementation of 10 GbE in the backbone of a building in virtually all possible cases.

Improved single-mode fibers for increased transmission capacity ("OS1e"/OS2)

In order to bridge even longer distances, since November 2003 LEONI Kerpen has complemented the GigaLine® fiber optic cables of the categories "OM2e", "OM3" and "OM3e" by also offering GigaLine® cables with improved single-mode fibers of the category "OS1e".

Besides the maximum possible 10 Gigabit Ethernet segment lengths of 10 / 40 km, LEONI Kerpen GigaLine® cables with "OS1e" fibers also offer an increased transmission capacity via a higher maximum degree of utilisation of the fiber.
This higher maximum degree of utilisation of the "OS1e" fiber is achieved by reducing the OH peak usual for single-mode fibers up to now, an attenuation peak at 1,383 nm.



The single-mode fibers thus comply with IEC 60793-2-50 B1.3 / ITU G.652.D (International Telecommunication Union) and have a consistent useful wavelength range of 1310 nm to 1625 nm. This is a result of low fiber attenuation, which is lower than 0.36 dB/km in the range between 1310 nm and 1383 and below 0.22 dB/km in the range between 1550 nm and 1625 nm.

The polarization mode dispersion (PMD) is an important coefficient when systems with high bit rates transmit data over long distances. The PMD Link Design Value of GigaLine® cables with OS1e fibers is 0.06 ps/vkm, thus offering high reserves for 10 Gigabit Ethernet transmissions. For example: a 40 Gigabit Ethernet link over 100 km allows a maximum PMD coefficient of 0.25 ps/vkm.

GigaLine® cables offer high reserves for future applications and systems. They are not only used in the classical LAN and campus area – they are also the solution of choice for wavelength multiplex systems and fiber-to-the-home networks.

Conclusion:

The control of the data flows of the future therefore requires maximum care in the planning and execution of the passive network infrastructure. One important aspect here is the selection of the suitable fiber type and quality!

Comparison of the transmission characteristics of GigaLine® with the requirements of the standard:

	Comparison between fiber category OM1 and GigaLine® G62.5/125 "OM1e"			
	850 nm		1,300/1,310 nm	
	Requirements of standard	GigaLine®	Requirements of standard	GigaLine®
Attenuation	3.5 dB/km	3.5 dB/km	1.5 dB/km	0.7 dB/km
Bandwidth/length product	200 MHz x km	250 MHz x km	500 MHz x km	800 MHz x km
Gigabit Ethernet segment length	275 m	500 m	550 m	1,000 m
10 Gigabit Ethernet segment length	33 m	65 m	300 m	450 m

	Comparison between fiber category OM2 and GigaLine® G50/125 "OM2e"			
	850 nm		1,300/1,310 nm	
	Requirements of standard	GigaLine®	Requirements of standard	GigaLine®
Attenuation	3.5 dB/km	2.5 dB/km	1.5 dB/km	0.7 dB/km
Bandwidth/length product	500 MHz x km	600 MHz x km	500 MHz x km	1,200 MHz x km
Gigabit Ethernet segment length	550 m	750 m	550 m	2,000 m
10 Gigabit Ethernet segment length	82 m	150 m	300 m	900 m

	Comparison between fiber category OM3 and GigaLine® G50/125 "OM3"			
	850 nm		1,300/1,310 nm	
	Requirements of standard	GigaLine®	Requirements of standard	GigaLine®
Attenuation	3.5 dB/km	2.5 dB/km	1.5 dB/km	0.7 dB/km
Bandwidth/length product	1,500 MHz x km	1,500 MHz x km	500 MHz x km	500 MHz x km
Laser bandwidth	2,000 MHz x km	2,000 MHz x km		
Gigabit Ethernet segment length	550 m	900 m	550 m	550 m
10 Gigabit Ethernet segment length	300 m	300 m	300 m	300 m

	Comparison between fiber category OM3 and GigaLine® G50/125 "OM3e"			
	850 nm		1,300/1,310 nm	
	Requirements of standard	GigaLine®	Requirements of standard	GigaLine®
Attenuation	3.5 dB/km	2.5 dB/km	1.5 dB/km	0.7 dB/km
Bandwidth/length product	1,500 MHz x km	3,000 MHz x km	500 MHz x km	500 MHz x km
Laser bandwidth	2,000 MHz x km	5,700 MHz x km		
Gigabit Ethernet segment length	550 m	1,000 m	550 m	550 m
10 Gigabit Ethernet segment length	300 m	550 m	300 m	300 m

	Comparison between fiber category OS1 and GigaLine® E9…10/125 "OS2e"			
	1,310 nm		1,550 nm	
	Requirements of standard	GigaLine®	Requirements of standard	GigaLine®
Attenuation	1.0 dB/km	0.36 dB/km	1.0 dB/km	0.22 dB/km
Attenuation at 1383 nm	not defined	≤ 0.36 dB/km		
10 Gigabit Ethernet segment length	10,000 m	10,000 m	40,000 m	40,000 m

GigaLine® DX 100 / DX 500 / DX 625

FO indoor cable (duplex figure 8) KL-I-V(ZN)H 2G/E

Structure:

- Two semi-tight buffered fibers in figure 8-shape ripcord. One core red, the other yellow (E9...10/125), green (G50/125) or blue (G62.5/125)
- Strain relief: aramid yarn
- Sheath: halogen-free compound
- Colour: orange (multimode), yellow (single-mode)

Inkjet printing:

LEONI GigaLine I-V(ZN)H 2 x 1 "fiber type" "core type" "2x ac symbol" "charge no." "reel no." "meter sign"

Application:

Patch cord, suitable for direct connection and for splicing

Temperature range:

Transport and storage:	-25°C to +70°C
During installation:	-5°C to +50°C
After installation:	-10°C to +70°C

Bending radius:

After installation:	30 mm
During installation:	60 mm

Fire performance:

Flame retardance acc. to:	IEC 60332-1 IEC 60332-3-24
Smoke density acc. to:	IEC 61034
Halogen-free acc. to:	IEC 60754-2

Fibers	Core	Outer ø	Weight	Tensile strength	Crush resistance		Calorific value		Colour	Article no.
		mm (approx.)	kg/km (approx.)	N (max.)	permanent N/dm (max.)	short-term N/dm (max.)	MJ/m (approx.)	kWh/m (approx.)		
2 G50/125	900µ	2.8x5.6	16	600	600	1,000	0.36	0.10	orange	8DA20003
	600µ	1.8x3.7	7	400	600	1,000	0.14	0.04	orange	8XA20013
2 G50/125 OM3	900µ	2.8x5.6	16	600	600	1,000	0.36	0.10	orange	8DA50003
	600µ	1.8x3.7	7	400	600	1,000	0.14	0.04	orange	8XA50013
2 G62.5/125	900µ	2.8x5.6	16	600	600	1,000	0.36	0.10	orange	8DB70003
	600µ	1.8x3.7	7	400	600	1,000	0.14	0.04	orange	8XB70013
2 E9...10/125	900µ	2.8x5.6	16	600	600	1,000	0.36	0.10	yellow	8DC72001
	600µ	1.8x3.7	7	400	600	1,000	0.14	0.04	yellow	8XC70013

GigaLine® DXO 100 / DXO 500 / DXO 625

FO indoor cable (duplex figure 0) KL-I-V(ZN)HH 2G/E

Structure:

- Two semi-tight buffered fibers, breakout construction (ø 2.1 mm) parallel under a common outer sheath. Orange (multimode) or yellow (single-mode)
- Strain relief: aramid yarn
- Sheath: halogen-free compound
- Ripcord under the sheath
- Colour: orange (multimode) or yellow (single-mode)

Inkjet printing:

LEONI GigaLine I-V(ZN)HH 2 x 1 "fiber type" "core type" "2x ac symbol" "charge no." "reel no." "meter sign"

Application:

Patch cord, suitable for direct connection and for splicing.
Particularly suitable for horizontal cabling and fiber-to-the-desk applications and for installation in conduits and ducts.

Temperature range:

Transport and storage:	-25°C to +70°C
During installation:	-5°C to +50°C
After installation:	-10°C to +70°C

Bending radius (above flat side):

After installation:	35 mm
During installation:	65 mm
Single elements:	30 mm

Fire performance:

Flame retardance acc. to:	IEC 60332-1 IEC 60332-3-24
Smoke density acc. to:	IEC 61034
Halogen-free acc. to:	IEC 60754-2

Fibers	Core	Outer ø	Weight	Tensile strength	Crush resistance		Calorific value		Colour	Article no.
		mm (approx.)	kg/km (approx.)	N (max.)	permanent N/dm (max.)	short-term N/dm (max.)	MJ/m (approx.)	kWh/m (approx.)		
2 G50/125	900µ	3.1x5.2	18	600	500	750	0.63	0.18	orange	8DA20011
2 G50/125 OM3	900µ	3.1x5.2	18	600	500	750	0.63	0.18	orange	8DA50011
2 G62.5/125	900µ	3.1x5.2	18	600	500	750	0.63	0.18	orange	8DB70011
2 E9...10/125	900µ	3.1x5.2	18	600	500	750	0.63	0.18	yellow	8DC70010

GigaLine® AT 100 / AT 500 / AT 625

FO indoor cable (breakout cable) KL-I-V(ZN)HH n x G/E

Structure:

- Up to 12 900µ semi-tight buffered fibers breakout design (ø 2.1mm) stranded under a common outer sheath. Orange (multimode) or yellow (single-mode)
- Strain relief: aramid yarn
- Ripcord under the sheath
- Sheath: halogen-free compound; colour: orange (multimode) or yellow (single-mode)

Inkjet printing:

LEONI GigaLine I-V(ZN)HH n "fiber type" "core type" "2x ac symbol" "charge no." "reel no." "meter sign"

Application:

Suitable for direct connection and for splicing.
Particularly suitable for horizontal cabling for installation in conduits and ducts.

Temperature range:

Transport and storage:	-25°C to +70°C
During installation:	-5°C to +50°C
After installation:	-10°C to +70°C

Bending radius:

After installation:	30 mm
During installation:	60 mm
Single elements:	30 mm

Fire performance:

Flame retardance acc. to:	IEC 60332-1 IEC 60332-3-24
Smoke density acc. to:	IEC 61034
Halogen-free acc. to:	IEC 60754-2

Fibers	Outer ø	Weight	Tensile strength	Crush resistance		Calorific value		Article no.			
	mm (approx.)	kg/km (approx.)	N (max.)	permanent N/dm (max.)	short-term N/dm (max.)	MJ/m (approx.)	kWh/m (approx.)	OM1e G62.5/125	OM2e G50/125	OM3 G50/125	OS2e E9…10/125
2 G/E	7.0	40	800	1,000	1,500	1.10	0.30	8BB70011	8BA20011	8BA50011	8BC70011
4 G/E	7.0	45	800	1,000	1,500	1.10	0.30	8BB70012	8BA20012	8BA50012	8BC70012
6 G/E	8.2	65	1,000	1,000	1,500	1.18	0.32	8BB70013	8BA20013	8BA50013	8BC70013
8 G/E	9.6	95	1,000	1,000	1,500	1.31	0.36	8BB70014	8BA20014	8BA50014	8BC70014
10 G/E	11.0	135	1,000	1,000	1,500	1.42	0.39	8BB70015	8BA20015	8BA50015	8BC70015
12 G/E	12.5	155	1,000	1,000	1,500	1.57	0.44	8BB70016	8BA20016	8BA50016	8BC70016

GigaLine® M 100 / M 500 / M 625

FO indoor cable (mini-breakout) KL-I-V(ZN)H n x G/E

Structure:

- Up to 12 900µm semi-tight buffered fibers under a common sheath
  Colour code acc. to EIA/TIA 598C
  blue (1), orange (2), green (3), brown (4), grey (5), white (6), red (7), black (8), yellow (9), violet (10), pink (11), turquoise (12)
- Strain relief: aramid yarn
- Sheath: halogen-free compound;
  colour: orange (multimode) or yellow (single-mode)

Inkjet printing:
LEONI GigaLine I-V(ZN)H n "fiber type" "core type" "2x ac symbol" "charge no." "reel no." "meter sign"

Application:
Suitable for direct connection and for splicing.
Particularly suitable for horizontal cabling for installation in conduits and ducts.

Temperature range:

Transport and storage:	-25°C to +70°C
During installation:	-5°C to +50°C
After installation:	-10°C to +70°C

Bending radius:

After installation:	10 x outer diameter
During installation:	15 x outer diameter
Single elements:	30 mm

Fire performance:

Flame retardance acc. to:	IEC 60332-1 IEC 60332-3-24
Smoke density acc. to:	IEC 61034
Halogen-free acc. to:	IEC 60754-2

Fibers	Outer ø	Weight	Tensile strength	Crush resistance		Calorific value		Article no.			
	mm (approx.)	kg/km (approx.)	N (max.)	permanent N/dm (max.)	short-term N/dm (max.)	MJ/m (approx.)	kWh/m (approx.)	OM1e G62.5/125	OM2e G50/125	OM3 G50/125	OS2e E9…10/125
2 G/E	4.2	14	400	500	1,000	0.45	0.13	8MB70011	8MA20011	8MA50011	8MC70011
4 G/E	4.8	21	400	500	1,000	0.47	0.13	8MB70012	8MA20012	8MA50012	8MC70012
6 G/E	5.9	25	800	500	1,000	0.50	0.14	8MB70013	8MA20013	8MA50013	8MC70013
8 G/E	6.1	30	800	500	1,000	0.52	0.14	8MB70014	8MA20014	8MA50014	8MC70014
12 G/E	7.0	38	800	500	1,000	0.55	0.15	8MB70016	8MA20016	8MA50016	8MC70016

GigaLine® VQ 100 M / VQ 500 M / VQ 625 M

FO universal cable (mini-breakout) KL-U-VQ(ZN)H n x G/E

Structure:

- Up to 24 900µ tight buffered fibers under a common sheath
  Colour code acc. to EIA/TIA 598C
  blue (1), orange (2), green (3), brown (4), grey (5), white (6), red (7), black (8), yellow (9), violet (10), pink (11), turquoise (12)
  fibers 13-24 with black ring sign
- Strain relief: aramid yarn
- Sheath: halogen-free compound;
  colour: yellow

Inkjet printing:
LEONI GigaLine U-VQ(ZN)H n "fiber type" "core type" "2x ac symbol" "charge no." "reel no." "meter sign"

Application:
Suitable for direct connection, campus/backbone cabling, indoor/outdoor installation, in dry cable ducts and conduits, building entry without additional transition points (splices) possible.

Temperature range:

Transport and storage:	-25°C to +70°C
During installation:	-5°C to +50°C
After installation:	-20°C to +70°C

Bending radius:

After installation:	10 x outer diameter
During installation:	15 x outer diameter

Longitudinally watertight:
IEC 60794-1-2 F5

Fire performance:

Flame retardance acc. to:	IEC 60332-1 IEC 60332-3-24
Smoke density acc. to:	IEC 61034
Halogen-free acc. to:	IEC 60754-2

Fibers	Outer ø	Weight	Tensile strength	Crush resistance		Calorific value		Article no.			
	mm (approx.)	kg/km (approx.)	N (max.)	permanent N/dm (max.)	short-term N/dm (max.)	MJ/m (approx.)	kWh/m (approx.)	OM1e G62.5/125	OM2e G50/125	OM3 G50/125	OS2e E9…10/125
6 G/E	5.9	25	800	300	500	0.50	0.14	8NB71003	8NA21003	8NA51003	8NC71003
12 G/E	7.0	38	800	300	500	0.55	0.15	8NB71006	8NA21006	8NA51006	8NC71006
24 G/E	9.4	72	800	300	500	0.92	0.25	8NB71009	8NA21009	8NA51009	8NC71009

GigaLine® DQ 100 Uc / DQ 500 Uc / DQ 625 Uc

FO universal cable (heavy-duty) KL-U-DQ(ZN)B2YFR 1 x G/E

Structure:

- Central gel-filled loose tube for up to 24 fibers
- Colour code fibers 1-12:
  red, green, blue, yellow, white, grey, brown, violet, turquoise, black, orange, pink
  fibers 13-24 with black ring sign
  red, green, blue, yellow, white, grey, brown, violet, turquoise, nature, orange, pink
- Colour code tubes: yellow (E9/125), green (G50/125), blue (G62.5/125)
- Strain relief and rodent protection: glass rovings
- Two ripcords under the sheath
- Sheath: halogen-free compound; colour: black

Inkjet printing:
LEONI GigaLine U-DQ(ZN)B2YFR n "fiber type" 2500 N "2x ac symbol" "charge no." "reel no." "meter sign"

Application:
Universal cable for installation directly in the ground, in ducts or in conduits. For indoor installation in case of increased mechanical requirements and rodent hazard; building entry without additional transition points (splices) possible.

Temperature range:

Transport and storage:	-25°C to +70°C
During installation:	-5°C to +50°C
After installation:	-25°C to +70°C

Bending radius:

After installation:	15 x outer diameter
During installation:	20 x outer diameter

Longitudinally watertight:
IEC 60794-1-2 F5

Fire performance:

Flame retardance acc. to:	IEC 60332-1
	IEC 60332-3-24
Smoke density acc. to:	IEC 61034
Halogen-free acc. to:	IEC 60754-2

Fibers	Outer ø	Weight	Tensile strength	Crush resistance		Calorific value		Article no.			
	mm (approx.)	kg/km (approx.)	N (max.)	permanent N/dm (max.)	short-term N/dm (max.)	MJ/m (approx.)	kWh/m (approx.)	OM1e G62.5/125	OM2e G50/125	OM3 G50/125	OS2e E9…10/125
1x2	8.7	63	2,500	3,000	5,000			8LB70001	8LA20001	8LA50001	8LC70001
1x4	8.7	63	2,500	3,000	5,000			8LB70002	8LA20002	8LA50002	8LC70002
1x6	8.7	63	2,500	3,000	5,000			8LB70003	8LA20003	8LA50003	8LC70003
1x8	8.7	63	2,500	3,000	5,000			8LB70004	8LA20004	8LA50004	8LC70004
1x10	8.7	63	2,500	3,000	5,000			8LB70005	8LA20005	8LA50005	8LC70005
1x12	8.7	63	2,500	3,000	5,000			8LB70006	8LA20006	8LA50006	8LC70006
1x16	9.2	76	2,500	3,000	5,000			8LB70007	8LA20007	8LA50007	8LC70007
1x20	9.2	76	2,500	3,000	5,000			8LB70008	8LA20008	8LA50008	8LC70008
1x24	9.2	76	2,500	3,000	5,000			8LB70009	8LA20009	8LA50009	8LC70009

GigaLine® DQ 100 U / DQ 500 U / DQ 625 U

FO universal cable (single tube) KL-U-DQ(ZN)BH 1 x G/E

Structure:

- Central gel-filled loose tube for up to 24 fibers
- Colour code fibers 1-12:
  red, green, blue, yellow, white, grey, brown, violet, turquoise, black, orange, pink
  fibers 13-24 with black ring sign
  red, green, blue, yellow, white, grey, brown, violet, turquoise, nature, orange, pink
- Colour code tubes: yellow (E9/125), green (G50/125), blue (G62.5/125)
- Strain relief and rodent protection: glass rovings
- Sheath: halogen-free compound;
  colour: yellow

Inkjet printing:
LEONI GigaLine U-DQ(ZN)BH n "fiber type" 1750 N "2x ac symbol" "order no." "reel no." "meter sign"

Application:
Suitable for splicing.
Campus/backbone cabling, for indoor installation in case of increased mechanical requirements and rodent hazard; for outdoor installation in dry conduits; building entry without additional transition points (splices) possible.

Temperature range:

Transport and storage:	-25°C to +70°C
During installation:	-5°C to +50°C
After installation:	-25°C to +70°C

Bending radius:

After installation:	15 x outer diameter
During installation:	20 x outer diameter

Longitudinally watertight:
IEC 60794-1-2 F5

Fire performance:

Flame retardance acc. to:	IEC 60332-1 IEC 60332-3-24
Smoke density acc. to:	IEC 61034
Halogen-free acc. to:	IEC 60754-2

Fibers	Outer ø	Weight	Tensile strength	Crush resistance		Calorific value		Article no.			
	mm (approx.)	kg/km (approx.)	N (max.)	permanent N/dm (max.)	short-term N/dm (max.)	MJ/m (approx.)	kWh/m (approx.)	OM1e G62.5/125	OM2e G50/125	OM3 G50/125	OS2e E9…10/125
1x2	7	48	1,750	1,500	2,500	0.70	0.19	8UB700A1	8UA200A1	8UA500A1	8UC700A1
1x4	7	48	1,750	1,500	2,500	0.70	0.19	8UB700A2	8UA200A2	8UA500A2	8UC700A2
1x6	7	48	1,750	1,500	2,500	0.70	0.19	8UB700A3	8UA200A3	8UA500A3	8UC700A3
1x8	7	48	1,750	1,500	2,500	0.70	0.19	8UB700A4	8UA200A4	8UA500A4	8UC700A4
1x10	7	48	1,750	1,500	2,500	0.70	0.19	8UB700A5	8UA200A5	8UA500A5	8UC700A5
1x12	7	48	1,750	1,500	2,500	0.70	0.19	8UB700A6	8UA200A6	8UA500A6	8UC700A6
1x16	7.5	55	1,750	1,500	2,500	0.72	0.20	8UB700A7	8UA200A7	8UA500A7	8UC700A7
1x20	7.5	55	1,750	1,500	2,500	0.72	0.20	8UB700A8	8UA200A8	8UA500A8	8UC700A8
1x24	7.5	55	1,750	1,500	2,500	0.72	0.20	8UB700A9	8UA200A9	8UA500A9	8UC700A9

GigaLine® D 100 CI / D 500 CI / D 625 CI

FO universal cable (with circuit integrity) KL-U-D(ZN)BH 1 x G/E

Structure:

- Central gel-filled loose tube for up to 24 fibers
- Colour code fibers 1-12:
  red, green, blue, yellow, white, grey, brown, violet, turquoise, black, orange, pink
  fibers 13-24 with black ring sign
  red, green, blue, yellow, white, grey, brown, violet, turquoise, nature, orange, pink
- Colour code tubes: yellow (E9/125), green (G50/125), blue (G62.5/125)
- Inner fire barrier: anti-fire glass fabric tape
- Outer fire barrier and strain relief: 2 layers of glass rovings
- Sheath: halogen-free compound;
  colour: yellow

Inkjet printing:

LEONI GigaLine fire secured U-D(ZN)BH n "fiber type" "2x ac symbol" "charge no." "reel no." "meter sign"

Application:

Suitable for splicing. Campus/backbone cabling, for indoor installation in case of increased mechanical requirements and rodent hazard; for outdoor installation in dry conduits; building entry without additional transition points (splices) possible.

Temperature range:

Transport and storage:	-25°C to +70°C
During installation:	-5°C to +50°C
After installation:	-25°C to +70°C

Bending radius:

After installation:	15 x outer diameter
During installation:	20 x outer diameter

Fire performance:

Flame retardance acc. to:	IEC 60332-1 IEC 60332-3-24
Smoke density acc. to:	IEC 61034
Halogen-free acc. to:	IEC 60754-2
Circuit integrity:	90 min. acc. to IEC 60331-11 and -25 Max. attenuation change 2.0 dB
Insulation integrity:	90 min. acc. to EN50200/DIN VDE 0482 Part 1 Max. attenuation change 2.0 dB

Fibers	Outer ø	Weight	Tensile strength	Crush resistance		Calorific value		Article no.			
	mm (approx.)	kg/km (approx.)	N (max.)	permanent N/dm (max.)	short-term N/dm (max.)	MJ/m (approx.)	kWh/m (approx.)	OM1e G62.5/125	OM2e G50/125	OM3 G50/125	OS2e E9…10/125
1x2	10.3	115	2,500	3,000	4,500	1.03	0.29	8UB700B1	8UA200B1	8UA500B1	8UC700B1
1x4	10.3	115	2,500	3,000	4,500	1.03	0.29	8UB700B2	8UA200B2	8UA500B2	8UC700B2
1x6	10.3	115	2,500	3,000	4,500	1.03	0.29	8UB700B3	8UA200B3	8UA500B3	8UC700B3
1x8	10.3	115	2,500	3,000	4,500	1.03	0.29	8UB700B4	8UA200B4	8UA500B4	8UC700B4
1x10	10.3	115	2,500	3,000	4,500	1.03	0.29	8UB700B5	8UA200B5	8UA500B5	8UC700B5
1x12	10.3	115	2,500	3,000	4,500	1.03	0.29	8UB700B6	8UA200B6	8UA500B6	8UC700B6
1x16	10.8	125	2,500	3,000	4,500	1.28	0.36	8UB700B7	8UA200B7	8UA500B7	8UC700B7
1x20	10.8	125	2,500	3,000	4,500	1.28	0.36	8UB700B8	8UA200B8	8UA500B8	8UC700B8
1x24	10.8	125	2,500	3,000	4,500	1.28	0.36	8UB700B9	8UA200B9	8UA500B9	8UC700B9

GigaLine® DQ 100 W / DQ 500 W / DQ 625 W

FO universal cable (armoured) KL-U-DQ(ZN)HWH 1 x G/E

Structure:

- Central gel-filled loose tube for up to 24 fibers
- Colour code fibers 1-12:
  red, green, blue, yellow, white, grey, brown, violet, turquoise, black, orange, pink
  fibers 13-24 with black ring sign
  red, green, blue, yellow, white, grey, brown, violet, turquoise, nature, orange, pink
- Colour code tubes: yellow (E9/125), green (G50/125), blue (G62.5/125)
- Strain relief: 2 layers of glass roving
- Inner sheath: halogen-free compound; colour: yellow
- Armour: corrugated steel tape
- Outer sheath: halogen-free compound; colour: yellow

Inkjet printing:
LEONI GigaLine U-DQ(ZN)HWH n "fiber type" "2x ac symbol" "charge no." "reel no." "meter sign"

Application:
Suitable for splicing. Campus/backbone cabling, for indoor installation in case of increased mechanical requirements and rodent hazard; for outdoor installation in dry conduits; building entry without additional transition points (splices) possible.

Temperature range:

Transport and storage:	-25°C to +70°C
During installation:	-5°C to +50°C
After installation:	-25°C to +70°C

Bending radius:

After installation:	15 x outer diameter
During installation:	20 x outer diameter

Longitudinally watertight:
IEC 60794-1-2 F5

Fire performance:

Flame retardance acc. to:	IEC 60332-1 IEC 60332-3-24
Smoke density acc. to:	IEC 61034
Halogen-free acc. to:	IEC 60754-2

Fibers	Outer ø	Weight	Tensile strength	Crush resistance		Calorific value		Article no.			
	mm (approx.)	kg/km (approx.)	N (max.)	permanent N/dm (max.)	short-term N/dm (max.)	MJ/m (approx.)	kWh/m (approx.)	OM1e G62.5/125	OM2e G50/125	OM3 G50/125	OS2e E9…10/125
1x2	12.5	210	2,500	2,500	3,500	1.60	0.45	8UB700D1	8UA200D1	8UA500D1	8UC700D1
1x4	12.5	210	2,500	2,500	3,500	1.60	0.45	8UB700D2	8UA200D2	8UA500D2	8UC700D2
1x6	12.5	210	2,500	2,500	3,500	1.60	0.45	8UB700D3	8UA200D3	8UA500D3	8UC700D3
1x8	12.5	210	2,500	2,500	3,500	1.60	0.45	8UB700D4	8UA200D4	8UA500D4	8UC700D4
1x10	12.5	210	2,500	2,500	3,500	1.60	0.45	8UB700D5	8UA200D5	8UA500D5	8UC700D5
1x12	12.5	210	2,500	2,500	3,500	1.60	0.45	8UB700D6	8UA200D6	8UA500D6	8UC700D6
1x16	12.5	210	2,500	2,500	3,500	1.60	0.45	8UB700D7	8UA200D7	8UA500D7	8UC700D7
1x20	12.5	210	2,500	2,500	3,500	1.60	0.45	8UB700D8	8UA200D8	8UA500D8	8UC700D8
1x24	12.5	210	2,500	2,500	3,500	1.60	0.45	8UB700D9	8UA200D9	8UA500D9	8UC700D9

GigaLine® DQ 100 U / DQ 500 U / DQ 625 U

LWL universal cable (multitube) KL-U-DQ(ZN)BH n x m G/E

Structure:

- stranded gel-filled loose tube for up to 12 fibers
- Colour code fibers: red, green, blue, yellow, white, grey, brown, violet, turquoise, black, orange, pink
- Colour code loose tubes: 1st tube red, 2nd white, others blue (G62.5/125), green (G50/125) or yellow (E9/125)
- Stranding: loose tubes (and filling elements) stranded around a central strength member
- Strain relief and rodent protection: glass rovings
- Two ripcords under the sheath
- Outer sheath: halogen-free compound; colour: yellow

Inkjet printing:
LEONI GigaLine U-DQ(ZN)BH n x m "fiber type" "2x ac symbol" "order no." "reel no." "meter sign"

Application:
Suitable for splicing. Campus/backbone cabling, for indoors installation in case of increased mechanical requirements and rodent hazard; for outdoor installation in dry conduits; building entry without additional transition points (splices) possible.

Temperature range:

Transport and storage:	-25°C to +70°C
During installation:	-5°C to +50°C
After installation:	-25°C to +70°C

Bending radius:

After installation:	15 x outer diameter
During installation:	20 x outer diameter

Longitudinally watertight: IEC 60794-1-2 F5

Fire performance:

Flame retardance acc. to:	IEC 60332-1 IEC 60332-3-24
Smoke density acc. to:	IEC 61034
Halogen-free acc. to:	IEC 60754-2

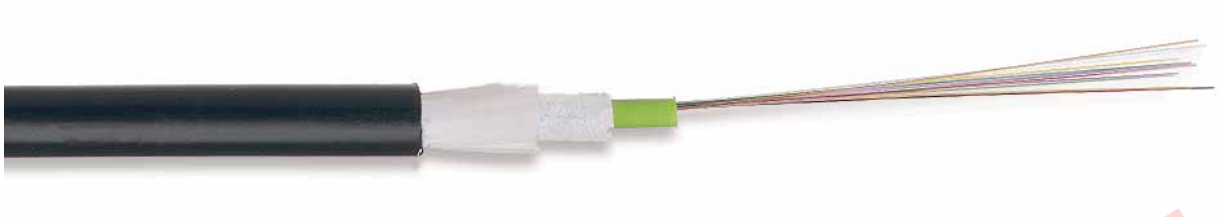
Impact: IEC 60794-1-2 E4

Bending: IEC 60794-1-2 E11

Fibers	Outer ø	Weight	Tensile strength	Crush resistance		Calorific value		Article no.			
	mm (approx.)	kg/km (approx.)	N (max.)	permanent N/dm (max.)	short-term N/dm (max.)	MJ/m (approx.)	kWh/m (approx.)	OM1e G62.5/125	OM2e G50/125	OM3 G50/125	OS2e E9…10/125
2x8	12.5	185	6,000	3,000	5,000	3.06	0.85	8UB70N01	8UA20N01	8UA50N01	8UC70N01
2x10	12.5	185	6,000	3,000	5,000	3.06	0.85	8UB70N02	8UA20N02	8UA50N02	8UC70N02
3x10	12.5	185	6,000	3,000	5,000	3.06	0.85	8UB70N03	8UA20N03	8UA50N03	8UC70N03
4x10	12.5	185	6,000	3,000	5,000	3.06	0.85	8UB70N04	8UA20N04	8UA50N04	8UC70N04
5x10	12.5	185	6,000	3,000	5,000	3.06	0.85	8UB70N05	8UA20N05	8UA50N05	8UC70N05
2x12	12.5	185	6,000	3,000	5,000	3.06	0.85	8UB70N06	8UA20N06	8UA50N06	8UC70N06
3x12	12.5	185	6,000	3,000	5,000	3.06	0.85	8UB70N07	8UA20N07	8UA50N07	8UC70N07
4x12	12.5	185	6,000	3,000	5,000	3.06	0.85	8UB70N08	8UA20N08	8UA50N08	8UC70N08
5x12	12.5	185	6,000	3,000	5,000	3.06	0.85	8UB70N09	8UA20N09	8UA50N09	8UC70N09
6x12	13.4	200	6,000	3,000	5,000	3.27	0.91	8UB70N10	8UA20N10	8UA50N10	8UC70N10
8x12	14.4	225	6,000	3,000	5,000	3.35	0.93	8UB70N11	8UA20N11	8UA50N11	8UC70N11
10x12	15.9	250	6,000	3,000	5,000	3.67	1.02	8UB70N12	8UA20N12	8UA50N12	8UC70N12
12x12	17.7	305	6,000	3,000	5,000	4.46	1.24	8UB70N13	8UA20N13	8UA50N13	8UC70N13

GigaLine® DQ 100 N / DQ 500 N / DQ 625 N

FO outdoor cable (single tube) KL-A-DQ(ZN)B2Y n G/E



Structure:

- Central gel-filled loose tube for up to 24 fibers
- Colour code fibers 1-12:
  red, green, blue, yellow, white, grey, brown, violet, turquoise, black, orange, pink
  fibers 13-24 with black ring sign
  red, green, blue, yellow, white, grey, brown, violet, turquoise, nature, orange, pink
- Colour code tubes: yellow (E9/125), green (G50/125), blue (G62.5/125)
- Strain relief and rodent protection: glass rovings
- Outer sheath: PE; colour: black RAL 9005

Inkjet printing:
LEONI GigaLine A-DQ(ZN)B2Y n "fiber type" 1750 N "2x ac symbol" "charge no." "reel no." "meter sign"

Application:
Suitable for splicing.
Outdoor cable for installation directly in the ground, in ducts or in conduits; for MAN (City Networks) and LAN (campus/backbone) applications.

Temperature range:

Transport and storage:	-25°C to +70°C
During installation:	-5°C to +50°C
After installation:	-25°C to +70°C

Bending radius:

After installation:	15 x outer diameter
During installation:	20 x outer diameter

Longitudinally watertight:
IEC 60794-1-2 F5

Impact:
IEC 60794-1-2 E4

Bending:
IEC 60794-1-2 E11

Fibers	Outer ø	Weight	Tensile strength	Crush resistance		Calorific value		Article no.			
	mm (approx.)	kg/km (approx.)	N (max.)	permanent N/dm (max.)	short-term N/dm (max.)	MJ/m (approx.)	kWh/m (approx.)	OM1e G62.5/125	OM2e G50/125	OM3 G50/125	OS2e E9...10/125
1x2	7.0	38	1,750	1,500	2,500	1.50	0.42	8AB700A1	8AA200A1	8AA500A1	8AC700A1
1x4	7.0	38	1,750	1,500	2,500	1.50	0.42	8AB700A2	8AA200A2	8AA500A2	8AC700A2
1x6	7.0	38	1,750	1,500	2,500	1.50	0.42	8AB700A3	8AA200A3	8AA500A3	8AC700A3
1x8	7.0	38	1,750	1,500	2,500	1.50	0.42	8AB700A4	8AA200A4	8AA500A4	8AC700A4
1x10	7.0	38	1,750	1,500	2,500	1.50	0.42	8AB700A5	8AA200A5	8AA500A5	8AC700A5
1x12	7.0	38	1,750	1,500	2,500	1.50	0.42	8AB700A6	8AA200A6	8AA500A6	8AC700A6
1x16	7.5	43	1,750	1,500	2,500	1.70	0.47	8AB700A7	8AA200A7	8AA500A7	8AC700A7
1x20	7.5	43	1,750	1,500	2,500	1.70	0.47	8AB700A8	8AA200A8	8AA500A8	8AC700A8
1x24	7.5	43	1,750	1,500	2,500	1.70	0.47	8AB700A9	8AA200A9	8AA500A9	8AC700A9

GigaLine® DQ 100 N / DQ 500 N / DQ 625 N

FO outdoor cable (multitube) KL-A-DQ(ZN)B2Y n x m G/E

Structure:

- Stranded gel-filled loose tube for up to 12 fibers
- Colour code fibers:
  red, green, blue, yellow, white, grey, brown, violet, turquoise, black, orange, pink
- Colour code loose tubes:
  1st tube red, 2nd white, others blue (G62.5/125), green (G50/125) or yellow (E9/125)
- Stranding: loose tubes (and filling elements) stranded around a central strength member
- Strain relief and rodent protection:glass rovings
- Two ripcords under the sheath
- Outer sheath: PE; colour: black

Inkjet printing:
LEONI GigaLine "n x m" "fiber type" "phone symbol" "2x ac symbol" "reel no." "meter sign"

Application:
Suitable for splicing. Outdoor cable for installation directly in the ground, in ducts or in conduits; for MAN (City Networks) and LAN (campus/backbone) applications.

Temperature range:
Transport and storage: -40°C to +70°C
During installation: -10°C to +50°C
After installation: -40°C to +70°C

Bending radius:
After installation: 15 x outer diameter
During installation: 20 x outer diameter

Longitudinally watertight:
IEC 60794-1-2 F5

Impact:
IEC 60794-1-2 E4

Bending:
IEC 60794-1-2 E11

Fibers	Outer ø	Weight	Tensile strength	Crush resistance		Calorific value		Article no.			
	mm (approx.)	kg/km (approx.)	N (max.)	permanent N/dm (max.)	short-term N/dm (max.)	MJ/m (approx.)	kWh/m (approx.)	OM1e G62.5/125	OM2e G50/125	OM3 G50/125	OS2e E9…10/125
2x8	12.5	185	9,000	6,000	10,000	5.58	1.55	8AB70101	8AA20101	8AA50101	8AC70101
2x10	12.5	185	9,000	6,000	10,000	5.58	1.55	8AB70102	8AA20102	8AA50102	8AC70102
3x10	12.5	185	9,000	6,000	10,000	5.58	1.55	8AB70103	8AA20103	8AA50103	8AC70103
4x10	12.5	185	9,000	6,000	10,000	5.58	1.55	8AB70104	8AA20104	8AA50104	8AC70104
5x10	12.5	185	9,000	6,000	10,000	5.58	1.55	8AB70105	8AA20105	8AA50105	8AC70105
2x12	12.5	185	9,000	6,000	10,000	5.58	1.55	8AB70106	8AA20106	8AA50106	8AC70106
3x12	12.5	185	9,000	6,000	10,000	5.58	1.55	8AB70107	8AA20107	8AA50107	8AC70107
4x12	12.5	185	9,000	6,000	10,000	5.58	1.55	8AB70108	8AA20108	8AA50108	8AC70108
5x12	12.5	185	9,000	6,000	10,000	5.58	1.55	8AB70109	8AA20109	8AA50109	8AC70109
6x12	13.4	200	9,000	6,000	10,000	5.79	1.61	8AB70110	8AA20110	8AA50110	8AC70110
8x12	14.4	225	9,000	6,000	10,000	6.19	1.72	8AB70111	8AA20111	8AA50111	8AC70111
10x12	15.9	250	9,000	6,000	10,000	6.59	1.83	8AB70112	8AA20112	8AA50112	8AC70112
12x12	17.7	305	9,000	6,000	10,000	7.12	1.98	8AB70113	8AA20113	8AA50113	8AC70113

GigaLine® DQ 100 W / DQ 500 W / DQ 625 W

FO outdoor cable (single tube, armoured) KL-A-DQ(ZN)2YW2Y n G/E

Structure:

- Central gel-filled loose tube for up to 24 fibers
- Colour code fibers 1-12:
  red, green, blue, yellow, white, grey, brown, violet, turquoise, black, orange, pink
  fibers 13-24 with black ring sign
  red, green, blue, yellow, white, grey, brown, violet, turquoise, nature, orange, pink
- Colour code tubes: yellow (E9/125), green (G50/125), blue (G62.5/125)
- Strain relief and rodent protection: glass rovings
- Inner sheath: PE
- Armouring: corrugated steel tape
- Outer sheath: PE; colour: black

Inkjet printing:
LEONI GigaLine "n" "fiber type" "phone symbol" "2x ac symbol" "reel no." "meter sign"

Application:
Suitable for splicing. Outdoor cable for installation directly in the ground, in ducts or in conduits; for MAN (City Networks) and LAN (campus/backbone) applications.

Temperature range:
Transport and storage: -25°C to +70°C
During installation: -5°C to +50°C
After installation: -25°C to +70°C

Bending radius:
After installation: 15 x outer diameter
During installation: 20 x outer diameter

Longitudinally watertight:
IEC 60794-1-2 F5

Impact:
IEC 60794-1-2 E4

Bending:
IEC 60794-1-2 E11

Fibers	Outer ø	Weight	Tensile strength	Crush resistance		Calorific value		Article no.			
	mm (approx.)	kg/km (approx.)	N (max.)	permanent N/dm (max.)	short-term N/dm (max.)	MJ/m (approx.)	kWh/m (approx.)	OM1e G62.5/125	OM2e G50/125	OM3 G50/125	OS2e E9...10/125
1x2	12.5	160	2,500	2,500	3,500	1.50	0.42	8AB70041	8AA20041	8AA50041	8AC70041
1x4	12.5	160	2,500	2,500	3,500	1.50	0.42	8AB70042	8AA20042	8AA50042	8AC70042
1x6	12.5	160	2,500	2,500	3,500	1.50	0.42	8AB70043	8AA20043	8AA50043	8AC70043
1x8	12.5	160	2,500	2,500	3,500	1.50	0.42	8AB70044	8AA20044	8AA50044	8AC70044
1x10	12.5	160	2,500	2,500	3,500	1.50	0.42	8AB70045	8AA20045	8AA50045	8AC70045
1x12	12.5	160	2,500	2,500	3,500	1.50	0.42	8AB70046	8AA20046	8AA50046	8AC70046
1x16	13.0	170	2,500	2,500	3,500	1.70	0.47	8AB70047	8AA20047	8AA50047	8AC70047
1x20	13.0	170	2,500	2,500	3,500	1.70	0.47	8AB70048	8AA20048	8AA50048	8AC70048
1x24	13.0	170	2,500	2,500	3,500	1.70	0.47	8AB70049	8AA20049	8AA50049	8AC70049

GigaLine® DQ 100 W / DQ 500 W / DQ 625 W

FO outdoor cable (multitube, armoured) KL-A-DQ(ZN)2YW2Y n x m G/E

Structure:

- Stranded gel-filled loose tube for up to 12 fibers
- Colour code fibers: red, green, blue, yellow, white, grey, brown, violet, turquoise, black, orange, pink
- Colour code loose tubes: 1st tube red, 2nd white, others blue (G62.5/125), green (G50/125) or yellow (E9/125)
- Stranding: loose tubes (and filling elements) stranded around a central strength member
- Strain relief and rodent protection: glass rovings
- Inner sheath: PE
- Two ripcords under the sheath
- Armouring: corrugated steel tape
- Outer sheath: PE; colour: black

Inkjet printing:
LEONI GigaLine "n x m" "fiber type" "phone symbol" "2x ac symbol" "reel no." "meter sign"

Application:
Suitable for splicing. Outdoor cable for installation directly in the ground, in ducts or in conduits; for MAN (City Networks) and LAN (campus/ backbone) applications.

Temperature range:
Transport and storage: -25°C to +70°C
During installation: -5°C to +50°C
After installation: -25°C to +70°C

Bending radius:
After installation: 15 x outer diameter
During installation: 20 x outer diameter

Longitudinally watertight:
EC 60794-1-2 F5

Impact:
IEC 60794-1-2 E4

Bending:
IEC 60794-1-2 E11

Fibers	Outer ø	Weight	Tensile strength	Crush resistance		Calorific value		Article no.			
	mm (approx.)	kg/km (approx.)	N (max.)	permanent N/dm (max.)	short-term N/dm (max.)	MJ/m (approx.)	kWh/m (approx.)	OM1e G62.5/125	OM2e G50/125	OM3 G50/125	OS2e E9…10/125
2x8	17.5	285	4,000	3,000	5,000	10.62	2.95	8AB70A01	8AA20A01	8AA50A01	8AC70A01
2x10	17.5	285	4,000	3,000	5,000	10.62	2.95	8AB70A02	8AA20A02	8AA50A02	8AC70A02
3x10	17.5	285	4,000	3,000	5,000	10.62	2.95	8AB70A03	8AA20A03	8AA50A03	8AC70A03
4x10	17.5	285	4,000	3,000	5,000	10.62	2.95	8AB70A04	8AA20A04	8AA50A04	8AC70A04
5x10	17.5	285	4,000	3,000	5,000	10.62	2.95	8AB70A05	8AA20A05	8AA50A05	8AC70A05
2x12	17.5	285	4,000	3,000	5,000	10.62	2.95	8AB70A06	8AA20A06	8AA50A06	8AC70A06
3x12	17.5	285	4,000	3,000	5,000	10.62	2.95	8AB70A07	8AA20A07	8AA50A07	8AC70A07
4x12	17.5	285	4,000	3,000	5,000	10.62	2.95	8AB70A08	8AA20A08	8AA50A08	8AC70A08
5x12	17.5	285	4,000	3,000	5,000	10.62	2.95	8AB70A09	8AA20A09	8AA50A09	8AC70A09
6x12	19.6	345	4,000	3,000	5,000	12.24	3.40	8AB70A10	8AA20A10	8AA50A10	8AC70A10
8x12	19.6	345	4,000	3,000	5,000	12.24	3.40	8AB70A11	8AA20A11	8AA50A11	8AC70A11
10x12	21.5	400	4,000	3,000	5,000	13.80	3.80	8AB70A12	8AA20A12	8AA50A12	8AC70A12
12x12	21.5	400	4,000	3,000	5,000	13.80	3.80	8AB70A13	8AA20A13	8AA50A13	8AC70A13

GigaLine® DF 100 L / DF 500 L / DF 625 L

FO outdoor cable (multitube, multi-layer sheath) KL-A-DF(ZN)(L)2Y n x m G/E

Structure:

- Stranded gel-filled loose tube for up to 12 fibers
- Colour code fibers: red, green, blue, yellow, white, grey, brown, violet, turquoise, black, orange, pink
- Colour code loose tubes: 1st tube red, 2nd white, others blue (G62.5/125), green (G50/125) or yellow (E9/125)
- Stranding: loose tubes (and filling elements) stranded around a central strength member.
- Filling: filling compound in the cable core
- Strain relief and rodent protection: glass rovings
- Outer sheath: multi-layer sheath, PE sheath bonded with plastic-coated aluminium tape
- Colour: black

Inkjet printing:
LEONI GigaLine "n x m" "fiber type" "phone symbol" "2x ac symbol" "reel no." "meter sign"

Application:
Longitudinally and latitudinally watertight outdoor cable for installation directly in the ground, in ducts or in conduits. For MAN (City Networks) and LAN (campus/backbone) applications; suitable for splicing.

Temperature range:

Transport and storage:	-25°C to +70°C
During installation:	-10°C to +50°C
After installation:	-25°C to +70°C

Bending radius:

After installation:	15 x outer diameter
During installation:	20 x outer diameter

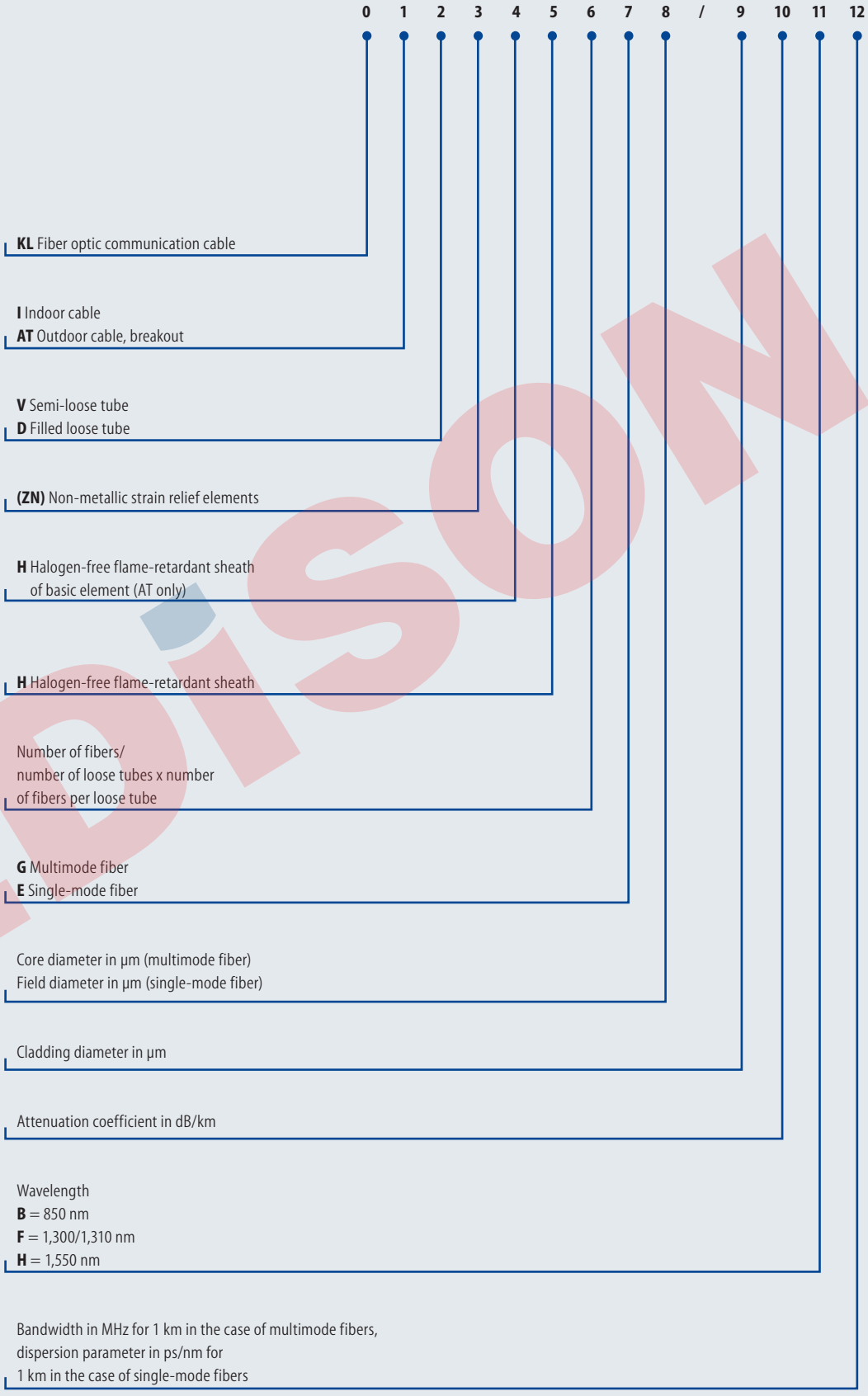
Longitudinally watertight:
IEC 60794-1-2 F5

Impact:
IEC 60794-1-2 E4

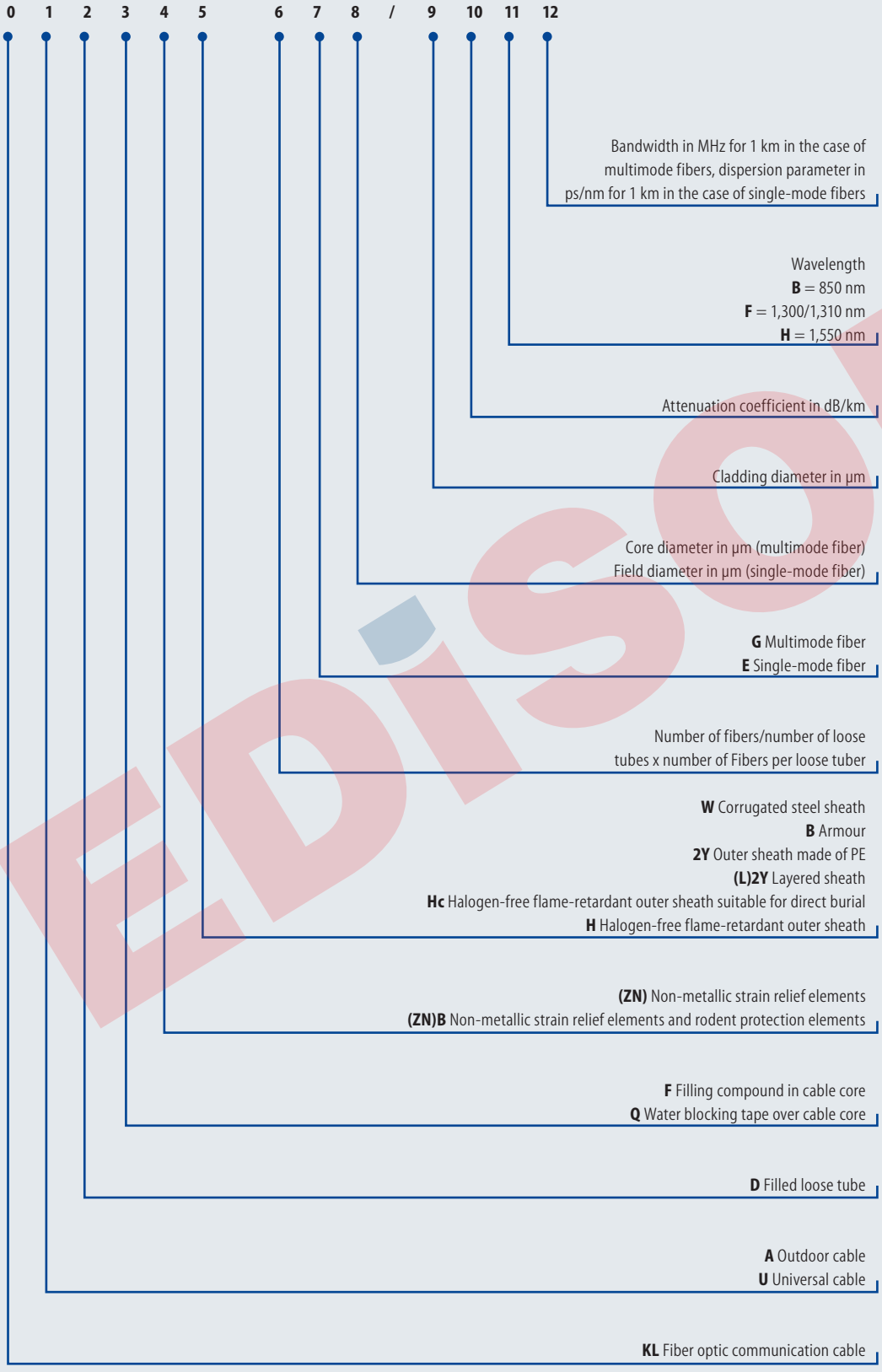
Bending:
IEC 60794-1-2 E11

Fibers	Outer ø	Weight	Tensile strength	Crush resistance		Calorific value		Article no.			
	mm (approx.)	kg/km (approx.)	N (max.)	permanent N/dm (max.)	short-term N/dm (max.)	MJ/m (approx.)	kWh/m (approx.)	OM1e G62.5/125	OM2e G50/125	OM3 G50/125	OS2e E9...10/125
2x8	12.1	140	3,000	1,500	3,000	4.97	1.38	8AB70401	8AA20401	8AA50401	8AC70401
2x10	12.1	140	3,000	1,500	3,000	4.97	1.38	8AB70402	8AA20402	8AA50402	8AC70402
3x10	12.1	140	3,000	1,500	3,000	4.97	1.38	8AB70403	8AA20403	8AA50403	8AC70403
4x10	12.1	140	3,000	1,500	3,000	4.97	1.38	8AB70404	8AA20404	8AA50404	8AC70404
5x10	12.1	140	3,000	1,500	3,000	4.97	1.38	8AB70405	8AA20405	8AA50405	8AC70405
2x12	12.1	140	3,000	1,500	3,000	4.97	1.38	8AB70406	8AA20406	8AA50406	8AC70406
3x12	12.1	140	3,000	1,500	3,000	4.97	1.38	8AB70407	8AA20407	8AA50407	8AC70407
4x12	12.1	140	3,000	1,500	3,000	4.97	1.38	8AB70408	8AA20408	8AA50408	8AC70408
5x12	12.1	140	3,000	1,500	3,000	4.97	1.38	8AB70409	8AA20409	8AA50409	8AC70409
6x12	13.0	165	3,000	1,500	3,000	5.65	1.57	8AB70410	8AA20410	8AA50410	8AC70410
8x12	14.4	200	4,000	1,500	3,000	5.87	1.63	8AB70411	8AA20411	8AA50411	8AC70411
10x12	15.9	245	4,000	1,500	3,000	6.37	1.77	8AB70412	8AA20412	8AA50412	8AC70412
12x12	17.7	300	4,000	1,500	3,000	7.24	2.01	8AB70413	8AA20413	8AA50413	8AC70413

GigaLine® abbreviations – for easy identification of the structural elements



to be found in fiber optic cables



GigaLine® fiber qualities

	G50/125 „OM2e“	G50/125 „OM3“	G 50/125 „OM3e“	G62.5/125 „OM1e“	E9…10/125 „OS2e“
Attenuation coefficient					
at 850 nm:	max. 2.5 dB/km	max. 2.5 dB/km	max. 2.5 dB/km	max. 3.0 dB/km	
at 1,300 nm:	max. 0.7 dB/km	max. 0.7 dB/km	max. 0.7 dB/km	max. 0.7 dB/km	
at 1,310 nm:					max. 0.36 dB/km
at 1,383 nm:					max. 0.36 dB/km
at 1,550 nm:					max. 0.22 dB/km
Bandwidth					
at 850 nm:	min. 600 MHz x km	min. 1,500 MHz x km	min. 3,000 MHz x km	min. 250 MHz x km	
at 1,300 nm:	min. 1,200 MHz x km	min. 500 MHz x km	min. 500 MHz x km	min. 800 MHz x km	
Laser bandwidth					
at 850 nm:		min. 2,000 MHz x km	min. 4,700 MHz x km		
Dispersion					
at 1,310 nm:					max. 3.5 ps/nm x km
at 1,550 nm:					max. 18 ps/nm x km
Segment length at Gigabit Ethernet					
at 850 nm					
(1,000BASE-SX):	min. 750 m	min. 900 m	min. 1,000 m	min. 500 m	
at 1,300 nm					
(1,000BASE-LX):	min. 2,000 m	min. 550 m	min. 550 m	min. 1,000 m	
Segment length at 10 Gigabit Ethernet					
at 850 nm					
(10GBASE-SR):	min. 150 m	min. 300 m	min. 550 m	min. 65 m	
at 1,300 nm					
(10GBASE-LX4):	min. 900 m	min. 300 m	min. 300 m	min. 450 m	min. 10,000 m
Numerical aperture	Nominal value 0.20	Nominal value 0.20	Nominal value 0.20	Nominal value 0.275	Nominal value 0.12
Refraction index					
at 850 nm:	Nominal value 1.483	Nominal value 1.483	Nominal value 1.483	Nominal value 1.497	
at 1300 nm:	Nominal value 1.478	Nominal value 1.478	Nominal value 1.478	Nominal value 1.493	
at 1310 nm:					Nominal value 1.467
at 1550 nm:					Nominal value 1.467
Test load	100 kpsi	100 kpsi	100 kpsi	100 kpsi	100 kpsi

Other Fiber qualities on request

GigaLine® colour codes

Wires (in the case of stranded loose tubes)	
Counting wire	red
Counting direction wire	white
Other wires	green for G50/125
	blue for G62.5/125
	yellow for E9…10/125
Dummy elements	natural colour
The wires are counted consecutively starting with the wire adjacent to the counting element. Dummy elements are not included in counting.	

Fibers (in the case of loose tubes)	
Fiber no.	**Colour**
1	red
2	green
3	blue
4	yellow
5	white
6	grey
7	brown
8	violet
9	turquoise
10	black
11	orange
12	pink
13	red-black
14	green-black
15	blue-black
16	yellow-black
17	white-black
18	grey-black
19	brown-black
20	violet-black
21	turquoise-black
22	natural-black
23	orange-black
24	pink-black

Mini-breakout cabel EIA/TIA 598C	
Fiber no.	**Colour**
1	blue
2	orange
3	green
4	brown
5	grey
6	white
7	red
8	black
9	yellow
10	violet
11	pink
12	turquoise

The FLine® classes –

FLine® 150, FLine® 300 and FLine® 550

In order to give the user a clear protocol-dependent planning foundation building up-on EN 50173 for link lengths at 10 GbE and GbE, LEONI Kerpen has introduced the new FLine® classes:

- FLine® – 150
- FLine® – 300
- FLine® – 550

150, 300 and 550 refer to the maximum link lengths for 10 GbE.

These FLine® classes include components optimised for performance and quality which together provide an ideally matched system.
The interaction of high-quality fibers (OM2e, OM3, OM3e) which go far beyond the standard and of high-quality plug connectors allow maximum range and performance for the applications involved (GbE / 10 GbE).

The system components are selected in such a way that the demands made on the link length (150, 300 and 550) and on the data rate are met.
This is why LEONI Kerpen consistently uses the same fiber quality for each system (cables, pigtails, patch cords).

For the user, this means that he selects the FLine® class (system) he requires depending on the link length he needs and the protocols to be transmitted (GbE/10 GbE). Tables 1 and 2 give him the protocol-dependent attenuation budget according to EN 50173. From this he can derive the number of possible connections for the entire link.

When the FLine® classes were put together, the following matched system components were taken into account:

- Fiber optic cables (GigaLine®) with laser-/dispersion-optimised multimode fibers which go far beyond the requirements of the standard (OM2e, OM3 or OM3e) and have the necessary reserve performance. (For fiber specifications please see GigaLine®)

- Fiber optic connectors (LC or SC etc.) with low insertion losses and high return losses attenuation.

Maximum link lengths for 10 Gigabit Ethernet system solutions

	FLine® classes for 10 GbE		
Multimode G 50			
	FLine® 150	**FLine® 300**	**FLine® 550**
Maximum link length for 10 GbE 10GBASE-SR	150	300	550
Attenuation budget for the link and for 10 GbE application	1.8 dB	2.6 dB	2.6 dB
Recommended plug connectors	ST, SC, LC FC-PC E 2000	SC, LC	SC,LC
Number of possible plug connections	4	8	6

All data refer to the first optical window, 850 nm

Maximum link lengths for 1 Gigabit Ethernet system solutions

	FLine® classes for 10 GbE		
Multimode G 50			
	FLine® 150	**FLine® 300**	**FLine® 550**
Maximum link length for 10 GbE	750	900	1,000
Attenuation budget for the link and for 10 GbE application	3.56 dB	3.56 dB	3.56 dB
Recommended plug connectors	ST, SC, LC FC-PC E 2000	SC, LC	SC,LC
Number of possible plug connections	4	6	5

All data refer to the first optical window, 850 nm

Diagram 1 shows the system reserves resulting from the high-quality fibers and connectors in relation to the EN 50173 standard.

The main advantages of these system reserves are as follows:

- Longer transmission distances for certain applications (100 Mb/s, 1 GbE, 10 GbE)
- The option of inserting more patch cords or splices
- Additional losses resulting from aging processes can be compensated for
- Network extensions can be implemented more easily and with a certain degree of security within the link length

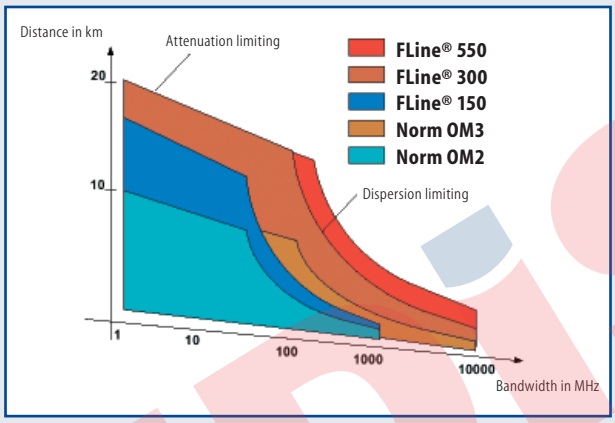


Diagram 1: FLine® 150, 300 and 550 system reserves in relation to the standard

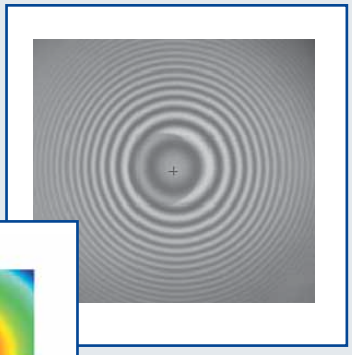
Quality is our benchmark

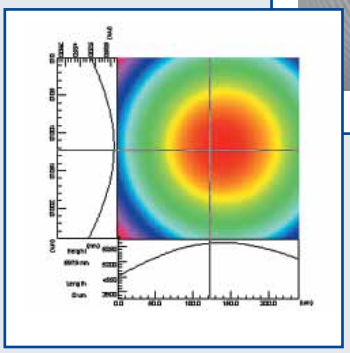
In the assembly of FO connectors, complicated grinding and polishing processes are necessary in addition to the adjustment of the fibers in the ferrule. The aim here is to use optimized processes to work the plug so precisely that the insertion losses and the reflections are as low as possible. The so-called PC grinding (PC = physical contact) was mainly developed for multimode channels, but it is suitable for single-mode channels too. During the convex polishing of the ferrule with spring-loaded suspension in the plug housing, a fiber/fiber transition comes into being on the front surfaces.
Thus, when two connectors are inserted into a coupling, the spring pressure causes all of the air between the two fibers of both plugs to be pushed out.
The glass/glass transition then has virtually no reflections and low losses.

In order to maximise the performance of a PC plug, the surface parameters of the plugs must be carefully monitored during the polishing process. The interferometer is a leading edge measuring instrument for this purpose. The overlapping of coherent light waves is used as a basis for measuring the quality of optical surfaces (ferrule surfaces).

The most important parameters are as follows:

- Apex offset (offset between the highest point of the ferrule and the centre of the fiber)
- Radius of the front surface of the plug (fiber/ferrule)
- Fiber position (undercut, protrusion)



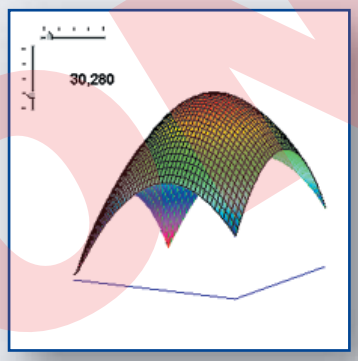


These parameters are important factors determining the long-term behaviour of a connector after plastic deformation. The following are derived in this way:

- Physical contact
- Insertion losses / return losses
- Fiber stress
- Fiber migration

All FLine® components are subjected to the most stringent of pre-delivery inspections. These include the following:

- The measurement of the attenuation of each assembled plug. The defined limits for attenuation measurement go far beyond the requirements of the international standards
- Optional OTDR measurement, for example for ready-made components (pre-assembled trunks)
- The monitoring of the process parameters via interferometer during plug assembly



Application: 10 GbE; attenuation budget OM2 = 1.8 dB, OM3 = 2.6 dB

	Number of plug connectors						
	4	6	8	10	12	14	Insertion attenuation of plug connector in dB
Link length in meters							
FLine® 150	150	/	/	/	/	/	< 0.4
FLine® 300	300	300	300	240	80	/	< 0.2
FLine® 550	550	550	400	240	80	/	< 0.2

All data refer to the first optical window (850 nm)

Application: 1 GbE; attenuation budget 3.56 dB

	Number of plug connectors							
	4	6	8	10	12	14	16	Insertion attenuation of plug connector in dB
Link length in meters								
FLine® 150	750	460	140	/	/	/	/	< 0.4
FLine® 300	900	900	780	620	460	300	140	< 0.2
FLine® 550	550	550	550	550	460	300	140	< 0.2

All data refer to the first optical window (850 nm)

GigaLine® ready-made –

safely through “thick and thin”

Ready-to-connect units are at the heart of FLine® systems engineering. Ready-made GigaLine® cables guarantee rapid, reliable and economic installation. The quality of the link is ensured by matched system components. The installation times can now be calculated.

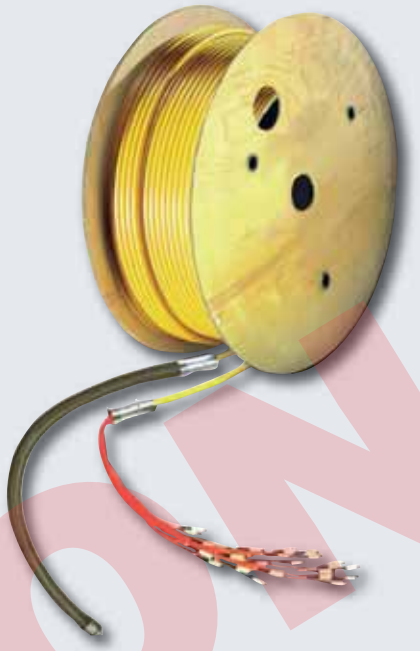
A permanent solution

On site installation often takes place in unfavourable conditions. Humidity, dirt and inaccessible places are common. For this reason, we use a rippled wire tube with the protection class IP 67 for our GigaLine® VKT cables. The particularly stable design with a moulded cable splitter including a screwed-on rippled wire tube protects our trunk cables from splash water and makes them crush-free.
The cables are tailor-made for construction site environments and outdoor cablings.
Indoor cables are equipped with dust protection without strain relief in order to prevent soiling of the plugs.

GigaLine® VKT cables ensure that the environmental conditions do not affect the quality of the channels – either during installation or afterwards.
The installation tube is flexible and has a small diameter. This means that the ready-made trunk can be easily fed into narrow, intricate shafts for secondary cabling and installation ducts.
There is a power grip connection to the distribution head. It works on the strain relief elements and the cladding. This means that the fibers remain stress-free. The design of the distribution head ensures the stability of the physical parameters and a long life.

Time is money

GigaLine® VKT stands for reliable and predictable installations. Reduced install time. Subsequent down times, for example due to the interruption of current operation of a computer system, are minimised.
This makes it possible to dispense with the splicing of cables or mounting of plugs, which often take place under adverse conditions on location. High investments in splicing devices and specially trained expert personnel can also be dispensed with.
GigaLine® VKT can also be used as cables with one end ready-made.



Fields of application

GigaLine® ready-made is the ideal choice for backbone cabling in the primary and secondary area and for collapsed backbones.

Quality means maximum safety

The assembly of plugs with high-quality ceramic ferrules is carried out in a clean environment. The front surfaces of the plugs are polished in an optimum way, so excellent plug transitions in reproducible quality (insertion and return losses) are guaranteed.
A test report showing the attenuation values for each fiber is supplied with the unit. As an option, OTDR measurements can also be carried out.

VKT IP67 – GigaLine® DQ 100, 500, 625 N

Ready-made outdoor fiber optical cable,
longitudinally watertight, with non-metallic rodent protection
Type: KL-A-DQ(ZN)B2Y

Aluminium distribution head with installation tube

- Protection from water and dirt
- Strain relief via distribution head
- Stress-free fibers
- Stability of transmission parameters
- Long life

Characteristics of the distribution head:

No. of Fibers	Ø of distribution head in mm (max.)	Ø of installation tube in mm (max.)	Strain relief N (max.)
2 to 12	25	33	750
16 to 24	33	43	750
48	33	43	750

Characteristics of plug:

Single-mode standard	Insertion losses: < 0.4 dB; return losses: > 40 dB
Multimode standard, FLine® 150	Insertion losses: < 0.4 dB; return losses: > 25 dB
Multimode FLine® 300, FLine® 550	Insertion losses: < 0.4 dB; return losses: > 35 dB

Characteristics of fiber:

E9..10/125	Single-mode fiber, transmission characteristics better than OS2. Attenuation coefficient: 0.36 dB/km at 1,310 nm; 0.25 dB/km at 1,550 nm Dispersion: max. 3.5 ps/nm x km at 1,310 nm; max. 18ps/nm x km at 1,550 nm
G50/125	Multimode fiber optimised for Gigabit Ethernet, transmission characteristics better than OM1, OM2.
FLine® 150	Attenuation coefficient: 2.5 dB/km at 850 nm; 0.7 dB/km at 1,300 nm Bandwidth: min. 600 MHz x km at 850 nm; min. 1,200 MHz x km at 1,300 nm Segment length with Gigabit Ethernet: min. 750 m at 850 nm; min. 2,000 m at 1,300 nm Segment length with 10 Gigabit Ethernet: min. 150 m at 850 nm; min. 900 m at 1,300 nm
G50/125 OM3	Multimode fiber optimised for 10 Gigabit Ethernet, transmission characteristics better than OM3.
FLine® 300	Attenuation coefficient: 2.5 dB/km at 850 nm; 0.7 dB/km at 1,300 nm Laser bandwidth: min. 2,000 MHz x km at 850 nm Bandwidth: min. 1,500 MHz x km at 850 nm; min. 500 MHz x km at 1,300 nm Segment length with Gigabit Ethernet: min. 900 m at 850 nm; min. 550 m at 1,300 nm Segment length with 10 Gigabit Ethernet: min. 300 m at 850 nm; min. 300 m at 1,300 nm
G50/125 OM3 "e"	Multimode fiber optimised for 10 Gigabit Ethernet, transmission characteristics better than OM3.
FLine® 550	Attenuation coefficient: 2.5 dB/km at 850 nm; 0.7 dB/km at 1,300 nm Laser bandwidth: min. 4,700 MHz x km at 850 nm Bandwidth: min. 3,500 MHz x km at 850 nm; min. 500 MHz x km at 1,300 nm Segment length with Gigabit Ethernet: min. 1,000 m at 850 nm; min. 550 m at 1,300 nm Segment length with 10 Gigabit Ethernet: min. 550 m at 850 nm; min. 300 m at 1,300 nm
G62.5/125	Multimode fiber optimised for 10 Gigabit Ethernet, transmission characteristics better than OM1. Attenuation coefficient: 3.0 dB/km at 850 nm; 0.7 dB/km at 1,300 nm Bandwidth: min. 250 MHz x km at 850 nm; min. 800 MHz x km at 1,300 nm Segment length with Gigabit Ethernet: min. 500 m at 850 nm; min. 1,000 m at 1,300 nm Segment length with 10 Gigabit Ethernet: min. 65 m at 850 nm; min. 450 m at 1,300 nm

GigaLine® VKT IP67, equipped with plugs at both ends and installation tube

Single-mode standard: insertion losses < 0.4 dB; return losses: > 40 dB						
No of Fibers	**SC**	**ST**	**E2,000**	**E2,000HRL**	**FC-PC**	**LC**
4	9Vxxx005	9Vxxx00C	9Vxxx00J	9Vxxx00Q	9Vxxx00X	9Vxxx014
6	9Vxxx006	9Vxxx00D	9Vxxx00K	9Vxxx00R	9Vxxx00Y	9Vxxx015
8	9Vxxx007	9Vxxx00E	9Vxxx00L	9Vxxx00S	9Vxxx00Z	9Vxxx016
12	9Vxxx008	9Vxxx00F	9Vxxx00M	9Vxxx00T	9Vxxx010	9Vxxx017
16	9Vxxx009	9Vxxx00G	9Vxxx00N	9Vxxx00U	9Vxxx011	9Vxxx018
24	9Vxxx00A	9Vxxx00H	9Vxxx00O	9Vxxx00V	9Vxxx012	9Vxxx019
48	9Vxxx00B	9Vxxx00I	9Vxxx00P	9Vxxx00W	9Vxxx013	9Vxxx01A

FLine® 150, multimode G50/125 OM2: insertion losses: < 0.4 dB; return losses: > 25 dB						
No. of Fibers	**SC**	**ST**	**E2,000**		**FC-PC**	**LC**
4	9Vxxx01B	9Vxxx01I	9Vxxx01P		9Vxxx01W	9Vxxx023
6	9Vxxx01C	9Vxxx01J	9Vxxx01Q		9Vxxx01X	9Vxxx024
8	9Vxxx01D	9Vxxx01K	9Vxxx01R		9Vxxx01Y	9Vxxx025
12	9Vxxx01E	9Vxxx01L	9Vxxx01S		9Vxxx01Z	9Vxxx026
16	9Vxxx01F	9Vxxx01M	9Vxxx01T		9Vxxx020	9Vxxx027
24	9Vxxx01G	9Vxxx01N	9Vxxx01U		9Vxxx021	9Vxxx028
48	9Vxxx01H	9Vxxx01O	9Vxxx01V		9Vxxx022	9Vxxx029

FLine® 300, multimode G50/125 OM3: insertion losses: < 0.2 dB; return losses: > 35 dB						
No. of Fibers	**SC**		**E2,000**			**LC**
4	9Vxxx02A		9Vxxx02H			9Vxxx02O
6	9Vxxx02B		9Vxxx02I			9Vxxx02P
8	9Vxxx02C		9Vxxx02J			9Vxxx02Q
12	9Vxxx02D		9Vxxx02K			9Vxxx02R
16	9Vxxx02E		9Vxxx02L			9Vxxx02S
24	9Vxxx02F		9Vxxx02M			9Vxxx02T
48	9Vxxx02G		9Vxxx02N			9Vxxx02U

FLine® 550, multimode G50/125 OM3 “e”: insertion losses: < 0.2 dB; return losses: > 35 dB						
Faseranzal	**SC**		**E2,000**			**LC**
4	9Vxxx02V		9Vxxx032			9Vxxx039
6	9Vxxx02W		9Vxxx033			9Vxxx03A
8	9Vxxx02X		9Vxxx034			9Vxxx03B
12	9Vxxx02Y		9Vxxx035			9Vxxx03C
16	9Vxxx02Z		9Vxxx036			9Vxxx03D
24	9Vxxx030		9Vxxx037			9Vxxx03E
48	9Vxxx031		9Vxxx038			9Vxxx03F

Multimode G62.5/125 OM1, standard: insertion losses: < 0.4 dB; return losses: > 25 dB						
No. of Fibers	**SC**	**ST**	**E2,000**		**FC-PC**	
4	9Vxxx03G	9Vxxx03N	9Vxxx03U		9Vxxx041	
6	9Vxxx03H	9Vxxx03O	9Vxxx03V		9Vxxx042	
8	9Vxxx03I	9Vxxx03P	9Vxxx03W		9Vxxx043	
12	9Vxxx03J	9Vxxx03Q	9Vxxx03X		9Vxxx044	
16	9Vxxx03K	9Vxxx03R	9Vxxx03Y		9Vxxx045	
24	9Vxxx03L	9Vxxx03S	9Vxxx03Z		9Vxxx046	
48	9Vxxx03M	9Vxxx03T	9Vxxx040		9Vxxx047	

Other designs available on request; xxx – length in m

VKT IP67 – GigaLine® DQ 100, 500, 625 U

Ready-made outdoor fiber optical cable,
longitudinally watertight, with non-metallic rodent protection
Type: KL-U-DQ(ZN)BH

Aluminium distribution head with installation tube

- Protection from dirt
- Strain relief via distribution head
- Stress-free fibers
- Stability of transmission parameters
- Long life

Characteristics of the distribution head:

No. of Fibers	Ø of distribution head in mm (max.)	Ø of installation tube in mm (max.)	Strain relief N (max.)
2 to 12	25	33	750
16 to 24	33	43	750
48	33	43	750

Characteristics of plug:

Single-mode standard	Insertion losses: < 0.4 dB; return losses: > 40 dB
Multimode standard, FLine® 150	Insertion losses: < 0.4 dB; return losses: > 25 dB
Multimode FLine® 300, FLine® 550	Insertion losses: < 0.4 dB; return losses: > 35 dB

Fiber characteristics:

E9...10/125	Single-mode fiber, transmission characteristics better than OS2. Attenuation coefficient: 0.36 dB/km at 1,310 nm; 0.25 dB/km at 1,550 nm Dispersion: max. 3.5 ps/nm x km at 1,310 nm; max. 18 ps/nm x km at 1,550 nm
G50/125	Multimode fiber optimised for Gigabit Ethernet, transmission characteristics better than OM1, OM2.
FLine® 150	Attenuation coefficient: 2.5 dB/km at 850 nm; 0.7 dB/km at 1,300 nm Bandwidth: min. 600 MHz x km at 850 nm; min. 1,200 MHz x km at 1,300 nm Segment length with Gigabit Ethernet: min. 750 m at 850 nm; min. 2,000 m at 1,300 nm Segment length with 10 Gigabit Ethernet: min. 150 m at 850 nm; min. 900 m at 1,300 nm
G50/125 OM3	Multimode fiber optimised for 10 Gigabit Ethernet, transmission characteristics better than OM3.
FLine® 300	Attenuation coefficient: 2.5 dB/km at 850 nm; 0.7 dB/km at 1,300 nm Laser bandwidth: min. 2,000 MHz x km at 850 nm Bandwidth: min. 1,500 MHz x km at 850 nm; min. 500 MHz x km at 1,300 nm Segment length with Gigabit Ethernet: min. 900 m at 850 nm; min. 550 m at 1,300 nm Segment length with 10 Gigabit Ethernet: min. 300 m at 850 nm; min. 300 m at 1,300 nm
G50/125 OM3 "e"	Multimode fiber optimised for 10 Gigabit Ethernet, transmission characteristics better than OM3.
FLine® 550	Attenuation coefficient: 2.5 dB/km at 850 nm; 0.7 dB/km at 1,300 nm Laser bandwidth: min. 4,700 MHz x km at 850 nm Bandwidth: min. 3,500 MHz x km at 850 nm; min. 500 MHz x km at 1,300 nm Segment length with Gigabit Ethernet: min. 1,000 m at 850 nm; min. 550 m at 1,300 nm Segment length with 10 Gigabit Ethernet: min. 550 m at 850 nm; min. 300 m at 1,300 nm
G62.5/125	Multimode fiber optimised for 10 Gigabit Ethernet, transmission characteristics better than OM1. Attenuation coefficient: 3.0 dB/km at 850 nm; 0.7 dB/km at 1,300 nm Bandwidth: min. 250 MHz x km at 850 nm; min. 800 MHz x km at 1,300 nm Segment length with Gigabit Ethernet: min. 500 m at 850 nm; min. 1,000 m at 1,300 nm Segment length with 10 Gigabit Ethernet: min. 65 m at 850 nm; min. 450 m at 1,300 nm

GigaLine® VKT IP67, equipped with plugs at both ends and installation tube

Single-mode standard: insertion losses < 0.4 dB; return losses: > 40 dB

No. of Fibers	SC	ST	E,2000	E2,000HRL	FC-PC	LC
4	9Vxxx048	9Vxxx04F	9Vxxx04M	9Vxxx04T	9Vxxx050	9Vxxx057
6	9Vxxx049	9Vxxx04G	9Vxxx04N	9Vxxx04U	9Vxxx051	9Vxxx058
8	9Vxxx04A	9Vxxx04H	9Vxxx04O	9Vxxx04V	9Vxxx052	9Vxxx059
12	9Vxxx04B	9Vxxx04I	9Vxxx04P	9Vxxx04W	9Vxxx053	9Vxxx05A
16	9Vxxx04C	9Vxxx04J	9Vxxx04Q	9Vxxx04X	9Vxxx054	9Vxxx05B
24	9Vxxx04D	9Vxxx04K	9Vxxx04R	9Vxxx04Y	9Vxxx055	9Vxxx05C
48	9Vxxx04E	9Vxxx04L	9Vxxx04S	9Vxxx04Z	9Vxxx056	9Vxxx05D

FLine® 150, multimode G50/125 OM2: insertion losses: < 0.4 dB; return losses: > 25 dB

No. of Fibers	SC	ST	E2,000	E2,000HRL	FC-PC	LC
4	9Vxxx05E	9Vxxx05L	9Vxxx05S		9Vxxx05Z	9Vxxx066
6	9Vxxx05F	9Vxxx05M	9Vxxx05T		9Vxxx060	9Vxxx067
8	9Vxxx05G	9Vxxx05N	9Vxxx05U		9Vxxx061	9Vxxx068
12	9Vxxx05H	9Vxxx05O	9Vxxx05V		9Vxxx062	9Vxxx069
16	9Vxxx05I	9Vxxx05P	9Vxxx05W		9Vxxx063	9Vxxx06A
24	9Vxxx05J	9Vxxx05Q	9Vxxx05X		9Vxxx064	9Vxxx06B
48	9Vxxx05K	9Vxxx05R	9Vxxx05Y		9Vxxx065	9Vxxx15N

FLine® 300, multimode G50/125 OM3: insertion losses: < 0.2 dB; return losses: > 35 dB

No. of Fibers	SC	ST	E2,000	E2,000HRL	FC-PC	LC
4	9Vxxx06C		9Vxxx06J			9Vxxx06Q
6	9Vxxx06D		9Vxxx06K			9Vxxx06R
8	9Vxxx06E		9Vxxx06L			9Vxxx06S
12	9Vxxx06F		9Vxxx06M			9Vxxx06T
16	9Vxxx06G		9Vxxx06N			9Vxxx06U
24	9Vxxx06H		9Vxxx06O			9Vxxx06V
48	9Vxxx06I		9Vxxx06P			9Vxxx06W

FLine® 550, multimode G50/125 OM3 "e": insertion losses: < 0.2 dB; return losses: > 35 dB

No. of Fibers	SC	ST	E2,000	E2,000HRL	FC-PC	LC
4	9Vxxx06X		9Vxxx074			9Vxxx07B
6	9Vxxx06Y		9Vxxx075			9Vxxx07C
8	9Vxxx06Z		9Vxxx076			9Vxxx07D
12	9Vxxx070		9Vxxx077			9Vxxx07E
16	9Vxxx071		9Vxxx078			9Vxxx07F
24	9Vxxx072		9Vxxx079			9Vxxx07G
48	9Vxxx073		9Vxxx07A			9Vxxx07H

Multimode G62.5/125 OM1, standard: insertion losses: < 0.4 dB; return losses: > 25 dB

No. of Fibers	SC	ST	E2,000	E2,000HRL	FC-PC	LC
4	9Vxxx07I	9Vxxx07P	9Vxxx07W		9Vxxx083	
6	9Vxxx07J	9Vxxx07Q	9Vxxx07X		9Vxxx084	
8	9Vxxx07K	9Vxxx07R	9Vxxx07Y		9Vxxx085	
12	9Vxxx07L	9Vxxx07S	9Vxxx07Z		9Vxxx086	
16	9Vxxx07M	9Vxxx07T	9Vxxx080		9Vxxx087	
24	9Vxxx07N	9Vxxx07U	9Vxxx081		9Vxxx088	
48	9Vxxx07O	9Vxxx07V	9Vxxx082		9Vxxx089	

Other designs available on request; xxx – length in m

GigaLine® VKT Breakout / GigaLine® AT 100, 500, 625

Ready-made fiber optical breakout cable (multicable), Type: KL-I-V(ZN)HH

Splice-free distribution with installation tube
- Protection from dirt
- Stability of transmission parameters
- Long life

Field of application:
- Floor cabling

Characteristics of plug:

Single-mode standard	Insertion losses: < 0.4 dB; return losses: > 40 dB
Multimode standard, FLine® 150	Insertion losses: < 0.4 dB; return losses: > 25 dB
Multimode FLine® 300, FLine® 550	Insertion losses: < 0.4 dB; return losses: > 35 dB

Fiber characteristics:

E9...10/125	Single-mode fiber, transmission characteristics better than OS2. Attenuation coefficient: 0.36 dB/km at 1,310 nm; 0.25 dB/km at 1,550 nm Dispersion: max. 3.5 ps/nm x km at 1,310 nm; max. 18 ps/nm x km at 1,550 nm
G50/125	Multimode fiber optimised for Gigabit Ethernet, transmission characteristics better than OM1, OM2.
FLine® 150	Attenuation coefficient: 2.5 dB/km at 850 nm; 0.7 dB/km at 1,300 nm Bandwidth: min. 600 MHz x km at 850 nm; min. 1,200 MHz x km at 1,300 nm Segment length with Gigabit Ethernet: min. 750 m at 850 nm; min. 2,000 m at 1,300 nm Segment length with 10 Gigabit Ethernet: min. 150 m at 850 nm; min. 900 m at 1,300 nm
G50/125 OM3	Multimode fiber optimised for 10 Gigabit Ethernet, transmission characteristics better than OM3.
FLine® 300	Attenuation coefficient: 2.5 dB/km at 850 nm; 0.7 dB/km at 1,300 nm Laser bandwidth: min. 2,000 MHz x km at 850 nm Bandwidth: min. 1,500 MHz x km at 850 nm; min. 500 MHz x km at 1,300 nm Segment length with Gigabit Ethernet: min. 900 m at 850 nm; min. 550 m at 1,300 nm Segment length with 10 Gigabit Ethernet: min. 300 m at 850 nm; min. 300 m at 1,300 nm
G50/125 OM3 "e"	Multimode fiber optimised for 10 Gigabit Ethernet, transmission characteristics better than OM3.
FLine® 550	Attenuation coefficient: 2.5 dB/km at 850 nm; 0.7 dB/km at 1,300 nm Laser bandwidth: min. 4,700 MHz x km at 850 nm Bandwidth: min. 3,500 MHz x km at 850 nm; min. 500 MHz x km at 1,300 nm Segment length with Gigabit Ethernet: min. 1,000 m at 850 nm; min. 550 m at 1,300 nm Segment length with 10 Gigabit Ethernet: min. 550 m at 850 nm; min. 300 m at 1,300 nm
G62.5/125	Multimode fiber optimised for 10 Gigabit Ethernet, transmission characteristics better than OM1. Attenuation coefficient: 3.0 dB/km at 850 nm; 0.7 dB/km at 1,300 nm Bandwidth: min. 250 MHz x km at 850 nm; min. 800 MHz x km at 1,300 nm Segment length with Gigabit Ethernet: min. 500 m at 850 nm; min. 1,000 m at 1,300 nm Segment length with 10 Gigabit Ethernet: min. 65 m at 850 nm; min. 450 m at 1,300 nm

GigaLine® VKT, equipped with plugs at both ends, with protective sleeve

AT 100, 500 625

AT 100, single-mode standard: insertion losses < 0.4 dB; return losses: > 40 dB						
No. of Fibers	**SC**	**ST**	**E2,000**	**E2,000HRL**	**FC-PC**	**LC**
2	9Vxxx11C	9Vxxx11H	9Vxxx11M	9Vxxx11R	9Vxxx11W	9Vxxx121
4	9Vxxx11D	9Vxxx11I	9Vxxx11N	9Vxxx11S	9Vxxx11X	9Vxxx122
6	9Vxxx11E	9Vxxx11J	9Vxxx11O	9Vxxx11T	9Vxxx11Y	9Vxxx123
8	9Vxxx11F	9Vxxx11K	9Vxxx11P	9Vxxx11U	9Vxxx11Z	9Vxxx124
12	9Vxxx11G	9Vxxx11L	9Vxxx11Q	9Vxxx11V	9Vxxx120	9Vxxx125

FLine® 150, AT 500, multimode G50/ 125 OM2: insertion losses: <0.4 dB; return losses: >25 dB						
No. of Fibers	**SC**	**ST**	**E2,000**	**E2,000HRL**	**FC-PC**	**LC**
2	9Vxxx126	9Vxxx12B	9Vxxx12G		9Vxxx12L	9Vxxx12Q
4	9Vxxx127	9Vxxx12C	9Vxxx12H		9Vxxx12M	9Vxxx12R
6	9Vxxx128	9Vxxx12D	9Vxxx12I		9Vxxx12N	9Vxxx12S
8	9Vxxx129	9Vxxx12E	9Vxxx12J		9Vxxx12O	9Vxxx12T
12	9Vxxx12A	9Vxxx12F	9Vxxx12K		9Vxxx12P	9Vxxx12U

FLine® 300, AT 500, multimode G50/ 125 OM3: insertion losses: <0.2 dB; return losses: >35dB						
No. of Fibers	**SC**	**ST**	**E2,000**	**E2,000HRL**	**FC-PC**	**LC**
2	9Vxxx13T		9Vxxx13Z			9Vxxx145
4	9Vxxx13U		9Vxxx140			9Vxxx146
6	9Vxxx13V		9Vxxx141			9Vxxx147
8	9Vxxx13W		9Vxxx142			9Vxxx148
12	9Vxxx13Y		9Vxxx144			9Vxxx14A

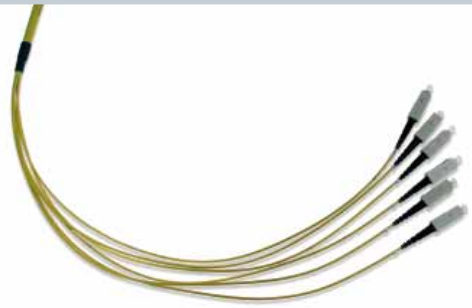
FLine® 550, AT 500, multimode G50/ 125 OM3 "e": insertion losses: <0.2 dB; return losses: >35dB						
No. of Fibers	**SC**	**ST**	**E2,000**	**E2,000HRL**	**FC-PC**	**LC**
2	9Vxxx14B		9Vxxx14H			9Vxxx14N
4	9Vxxx14C		9Vxxx14I			9Vxxx14O
6	9Vxxx14D		9Vxxx14J			9Vxxx14P
8	9Vxxx14E		9Vxxx14K			9Vxxx14Q
12	9Vxxx14G		9Vxxx14M			9Vxxx14S

AT 625, multimode G62.5/125 OM1, standard: insertion losses: < 0.4 dB; return losses: > 25 dB						
No. of Fibers	**SC**	**ST**	**E2,000**	**E2,000HRL**	**FC-PC**	**LC**
2	9Vxxx14T	9Vxxx14Z	9Vxxx155		9Vxxx15B	9Vxxx15H
4	9Vxxx14U	9Vxxx150	9Vxxx156		9Vxxx15C	9Vxxx15I
6	9Vxxx14V	9Vxxx151	9Vxxx157		9Vxxx15D	9Vxxx15J
8	9Vxxx14W	9Vxxx152	9Vxxx158		9Vxxx15E	9Vxxx15K
12	9Vxxx14Y	9Vxxx154	9Vxxx15A		9Vxxx15G	9Vxxx15M

Other designs available on request; xxx – length in m

GigaLine® VKT mini-breakout
GigaLine® M 100, 500, 625

Ready-made fiber optic mini-breakout cable, Type: KL-I-V(ZN)H



Splice-free splitting with protective sleeve
- Protection from dirt
- Stability of transmission parameters
- Long life

Field of application:
- Floor cabling

Characteristics of plug:

Single-mode standard	Insertion losses: < 0.4 dB; return losses: > 40 dB
Multimode standard, FLine® 150	Insertion losses: < 0.4 dB; return losses: > 25 dB
Multimode FLine® 300, FLine® 550	Insertion losses: < 0.4 dB; return losses: > 35 dB

Fiber characteristics:

E9...10/125	Single-mode fiber, transmission characteristics better than OS2. Attenuation coefficient: 0.36 dB/km at 1,310 nm; 0.25 dB/km at 1,550 nm Dispersion: max. 3.5 ps/nm x km at 1,310 nm; max. 18 ps/nm x km at 1,550 nm
G50/125	Multimode fiber optimised for Gigabit Ethernet, transmission characteristics better than OM1, OM2.
FLine® 150	Attenuation coefficient: 2.5 dB/km at 850 nm; 0.7 dB/km at 1,300 nm Bandwidth: min. 600 MHz x km at 850 nm; min. 1,200 MHz x km at 1,300 nm Segment length with Gigabit Ethernet: min. 750 m at 850 nm; min. 2,000 m at 1,300 nm Segment length with 10 Gigabit Ethernet: min. 150 m at 850 nm; min. 900 m at 1,300 nm
G50/125 OM3	Multimode fiber optimised for 10 Gigabit Ethernet, transmission characteristics better than OM3.
FLine® 300	Attenuation coefficient: 2.5 dB/km at 850 nm; 0.7 dB/km at 1,300 nm Laser bandwidth: min. 2,000 MHz x km at 850 nm Bandwidth: min. 1,500 MHz x km at 850 nm; min. 500 MHz x km at 1,300 nm Segment length with Gigabit Ethernet: min. 900 m at 850 nm; min. 550 m at 1,300 nm Segment length with 10 Gigabit Ethernet: min. 300 m at 850 nm; min. 300 m at 1,300 nm
G50/125 OM3 "e"	Multimode fiber optimised for 10 Gigabit Ethernet, transmission characteristics better than OM3.
FLine® 550	Attenuation coefficient: 2.5 dB/km at 850 nm; 0.7 dB/km at 1,300 nm Laser bandwidth: min. 4,700 MHz x km at 850 nm Bandwidth: min. 3,500 MHz x km at 850 nm; min. 500 MHz x km at 1,300 nm Segment length with Gigabit Ethernet: min. 1,000 m at 850 nm; min. 550 m at 1,300 nm Segment length with 10 Gigabit Ethernet: min. 550 m at 850 nm; min. 300 m at 1,300 nm
G62.5/125	Multimode fiber optimised for 10 Gigabit Ethernet, transmission characteristics better than OM1. Attenuation coefficient: 3.0 dB/km at 850 nm; 0.7 dB/km at 1,300 nm Bandwidth: min. 250 MHz x km at 850 nm; min. 800 MHz x km at 1,300 nm Segment length with Gigabit Ethernet: min. 500 m at 850 nm; min. 1,000 m at 1,300 nm Segment length with 10 Gigabit Ethernet: min. 65 m at 850 nm; min. 450 m at 1,300 nm

GigaLine® VKT, equipped with plugs at both ends and protective sleeve

M 100, 500, 625

M 100, single-mode standard: insertion losses < 0.4 dB; return losses: > 40 dB						
No. of Fibers	**SC**	**ST**	**E2,000**	**E2,000HRL**	**FC-PC**	**LC**
2	9Vxxx08A	9Vxxx08F	9Vxxx08K	9Vxxx08P	9Vxxx08U	9Vxxx08Z
4	9Vxxx08B	9Vxxx08G	9Vxxx08L	9Vxxx08Q	9Vxxx08V	9Vxxx090
6	9Vxxx08C	9Vxxx08H	9Vxxx08M	9Vxxx08R	9Vxxx08W	9Vxxx091
8	9Vxxx08D	9Vxxx08I	9Vxxx08N	9Vxxx08S	9Vxxx08X	9Vxxx092
12	9Vxxx08E	9Vxxx08J	9Vxxx08O	9Vxxx08T	9Vxxx08Y	9Vxxx093

FLine® 150, M 500, multimode G50/ 125 OM2: insertion losses: <0.4 dB; return losses: >25 dB						
No. of Fibers	**SC**	**ST**	**E2,000**	**E2,000HRL**	**FC-PC**	**LC**
2	9Vxxx094	9Vxxx099	9Vxxx09E		9Vxxx09J	9Vxxx09O
4	9Vxxx095	9Vxxx09A	9Vxxx09F		9Vxxx09K	9Vxxx09P
6	9Vxxx096	9Vxxx09B	9Vxxx09G		9Vxxx09L	9Vxxx09Q
8	9Vxxx097	9Vxxx09C	9Vxxx09H		9Vxxx09M	9Vxxx09R
12	9Vxxx098	9Vxxx09D	9Vxxx09I		9Vxxx09N	9Vxxx09S

FLine® 300, M 500, multimode G50/ 125 OM3: insertion losses: <0.2 dB; return losses: >35dB						
No. of Fibers	**SC**	**ST**	**E2,000**	**E2,000HRL**	**FC-PC**	**LC**
2	9Vxxx09T		9Vxxx09Y			9Vxxx103
4	9Vxxx09U		9Vxxx09Z			9Vxxx104
6	9Vxxx09V		9Vxxx100			9Vxxx105
8	9Vxxx09W		9Vxxx101			9Vxxx106
12	9Vxxx09X		9Vxxx102			9Vxxx107

FLine® 550, M 500, multimode G50/ 125 OM3 “e”: insertion losses: <0.2 dB; return losses: >35dB						
No. of Fibers	**SC**	**ST**	**E2,000**	**E2,000HRL**	**FC-PC**	**LC**
2	9Vxxx108		9Vxxx10D			9Vxxx10I
4	9Vxxx109		9Vxxx10E			9Vxxx10J
6	9Vxxx10A		9Vxxx10F			9Vxxx10K
8	9Vxxx10B		9Vxxx10G			9Vxxx10L
12	9Vxxx10C		9Vxxx10H			9Vxxx10M

M 625, multimode G62.5/125 OM1, standard: insertion losses: < 0.4 dB; return losses: > 25 dB						
No. of Fibers	**SC**	**ST**	**E2,000**	**E2,000HRL**	**FC-PC**	**LC**
2	9Vxxx10N	9Vxxx10S	9Vxxx10X		9Vxxx112	9Vxxx117
4	9Vxxx10O	9Vxxx10T	9Vxxx10Y		9Vxxx113	9Vxxx118
6	9Vxxx10P	9Vxxx10U	9Vxxx10Z		9Vxxx114	9Vxxx119
8	9Vxxx10Q	9Vxxx10V	9Vxxx110		9Vxxx115	9Vxxx11A
12	9Vxxx10R	9Vxxx10W	9Vxxx111		9Vxxx116	9Vxxx11B

Other designs available on request; xxx – length in m

FLine® and FLine® Smart –

multifunctional housing engineering

FLine® and FLine® Smart patch and splice housings can be used in all areas of in-house data cabling. The components are designed in such a way that speed and reliability are ensured in initial installation, maintenance and extensions.

FLine® patch and splice housings

A replaceable cable entry on the back offers the user all the freedom he requires during installation, no matter whether a straight cable entry, a 45° angled entry or breakout cable support is required. These parts can be replaced easily on location.

FLine® Smart patch and splice housings

panel engineering differs in design due to a prespecified straight cable and distribution head entry (VKT). Here it is possible to mount up to two PG glands or two distribution heads.

Facts which guarantee rapid and reliable initial installation:

In general:

- Standard versions of the housings are available as 1 or 2 RU
- The front panel is light grey, RAL 7035
- One RU can be equipped with up to 24 x SC-Duplex, 24 x LC-Duplex, 24 x MT-RJ, 24 x E 2,000, 24 x ST, 24 x FC couplings
- Exchangeable front panels to accommodate all usual fiber optic couplings
- The body of the housing is made of sheet steel and is thus extremely stable
- The couplings are premounted
- The admissible bending radii and the ease of assembly are observed even at high packing densities
- A telescopic extension makes the connecting components easy to access for the purposes of measurements and maintenance work

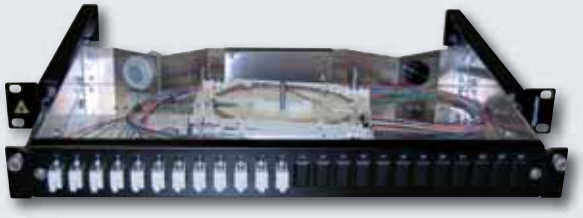
Splice housings

- Splice cassettes with pigtails already included
- The wires in the splice cassette are ready for splicing
- Pigtails are coloured (primary and secondary coating) according to the DIN IEC 60304 colour code
- The pigtails are marked (primary and secondary coating) according to the DIN IEC 60304 colour code. The result is rapid, safe assembly as it is no longer necessary to mark the individual pigtails

Patch housings

- The strain relief for the cable is ensured by fixing the distribution head directly to the housing. As a result, no other complicated fastening measures are required for the distribution head on the housing
- The distribution head of the ready-made trunk is secured on the housing to prevent twisting

FLine® patch/splice housing, telescopic



19" housing, 1 / 2 RU

Characteristics:

- Installation of a maximum of 2 fiber optic cables with a maximum total of 48 fibers
- Body of housing made of aluminium, exchangeable front panel made of sheet steel
- Telescopic, extension depth at least 300 mm
- Colour of front panel: light grey, RAL 7035
- Cable entry at an angle of 45° for better cable management
- Strain relief for the ready-made distribution head on the housing or PG gland for cable entries
- Dust protection
- Splice cassette with coloured pigtails,
  Gigabit Ethernet fibers (MM)
  Pigtail colour code:
  E9…10/125 according to DIN IEC 60304
  G50/125 according to DIN IEC 60304
  G62.5/125 according to DIN IEC 60304
- Pigtails already inserted into splice cassette
- Height: 44 mm (1 RU)
  Width: 483 mm (19")
  Depth: 255 mm
  Weight: 2.4 kg
- Screen-printed markings: Channel 1-12 / 1-24,
  A/B coding with SC/ST/FC components

Components:

- Available with up to 24 slots or without components
- The following couplings can be used:
  SC-Duplex/SC-Duplex
  FC-PC, FC-PC(HRL) (SM)
  ST/ST
  E2,000/E2,000
  E2,000HRL/E2,000HRL (SM)
  MT-RJ/MT-RJ (MM)
  LC-Duplex

Accessories:

- Blind plug for front panel, Splice protector
  (maximum of 12 pcs. in one splice cassette)

FLine® splice housing, telescopic

Single-mode						
No. of Fibers	**SC-Duplex Plastic/Cer**	**SC-Duplex-ST Plastic/Cer**	**ST Met/Cer**	**LC-Duplex Plastic/Cer**	**E2,000 Plastic/Cer**	**E2,000HRL Plastic/Cer**
6	9D110083	9D110087	9D110030	9D110091	9D110094	9D110157
12	9D110084	9D110088	9D110031	9D110092	9D110095	9D110158
24	9D110085	9D110089	9D110032	9D110093	9D110096	9D110159
48	9D110086	9D110090	x	9D110082	x	x

Multimode 50µ OM2						
No. of Fibers	**SC-Duplex Plastic/PhBz**	**SC-Duplex-ST Plastic/PhBz**	**ST Met/PhBz**	**LC-Duplex Plastic/PhBz**	**E2,000 Plastic/Cer**	
6	9D110097	9D110101	9D110041	9D110105	9D110108	x
12	9D110098	9D110102	9D110042	9D110106	9D110109	x
24	9D110099	9D110103	9D110043	9D110107	9D110110	x
48	9D110100	9D110104	x	9D110080	x	x

Multimode 50µ OM3						
No. of Fibers	**SC-Duplex Plastic/PhBz**	**SC-Duplex-ST Plastic/PhBz**	**ST Met/PhBz**	**LC-Duplex Plastic/PhBz**	**E2,000 Plastic/Cer**	
6	9D110111	9D110115	9D110052	9D110119	9D110123	x
12	9D110112	9D110116	9D110053	9D110120	9D110124	x
24	9D110113	9D110117	9D110054	9D110121	9D110125	x
48	9D110114	9D110118	x	9D110122	x	x

Multimode 50µ OM3 e						
No. of Fibers	**SC-Duplex Plastic/PhBz**	**SC-Duplex-ST Plastic/PhBz**	**ST Met/PhBz**	**LC-Duplex Plastic/PhBz**	**E2,000 Plastic/Cer**	
6	9D110126	9D110130	9D110063	9D110134	9D110138	x
12	9D110127	9D110131	9D110064	9D110135	9D110139	x
24	9D110128	9D110132	9D110065	9D110136	9D110140	x
48	9D110129	9D110133	x	9D110137	x	x

Multimode 62.5µ OM1						
No. of Fibers	**SC-Duplex Plastic/PhBz**	**SC-Duplex-ST Plastic/PhBz**	**ST Met/Cer**	**LC-Duplex Plastic/Cer**	**E2,000 Plastic/Cer**	
6	9D110141	9D110145	9D110077	9D110149	9D110152	x
12	9D110142	9D110146	9D110078	9D110150	9D110153	x
24	9D110143	9D110147	9D110079	9D110151	9D110154	x
48	9D110144	9D110148	x	9D110081	9D110155	x

other versions available on request

FLine® distribution panel, telescopic

Single-mode						
No. of Fibers	**SC-Duplex Plastic/Cer**	**SC-Duplex-ST Plastic/Cer**	**ST Met/Cer**	**LC-Duplex Plastic/Cer**	**E2,000 Plastic/Cer**	**E2,000HRL Plastic/Cer**
6	9D120024	9D120028	9D120008	9D120032	9D120035	9D120055
12	9D120025	9D120029	9D120009	9D120033	9D120036	9D120056
24	9D120026	9D120030	9D120010	9D120034	9D120037	9D120057
48	9D120027	9D120031	x	x	x	x

Multimode						
No. of Fibers	**SC-Duplex Plastic/PhBz**	**SC-Duplex-ST Plastic/PhBz**	**ST Met/PhBz**	**LC-Duplex Plastic/PhBz**	**E2,000 Plastic/Cer**	
6	9D120039	9D120047	9D120019	9D120051	9D120058	x
12	9D120040	9D120048	9D120020	9D120052	9D120059	x
24	9D120041	9D120049	9D120021	9D120053	9D120060	x
48	9D120042	9D120050	x	9D120054	x	x

other versions available on request

FLine® Smart patch housing

telescopic

19" housing, 1 / 2 RU

Characteristics:

- Installation of a maximum of 2 fiber optic cables with a maximum total of 48 fibers
- Body of housing made of sheet steel
- Extension depth at least 200 mm
- Colour of front panel: grey, RAL 7035
- Strain relief for the ready-made distribution head on the housing and PG gland for cable entries
- Dust protection
- Splice cassette with coloured pigtails, Gigabit Ethernet fibers (MM)
- Pigtail colour code: E9. . .10/125 according to DIN IEC 60304
  G50/125 according to DIN IEC 60304
  G62.5/125 according to DIN IEC 60304
- Pigtails already inserted into splice cassette
- Height: 44 mm (1 RU)
  Width: 483 mm (19")
  Depth: 230 mm
  Weight: 2.4 kg
- Screen-printed markings: Channel 1-12 / 1-24, A/B coding with SC/ST/FC components

Components:

- Available with up to 24 slots or without components
- The following couplings can be used: SC-Duplex
  FC-PC/FC-APC
  ST
  E2,000/E2,000 HRL
  MTRJ
  LC-Duplex

Accessories:

- Blind plug for front panel, splice protector (maximum of 12 pcs. in one splice cassette)

Single-mode						
No. of Fibers	**SC-Duplex Plastic/Cer**	**SC-Duplex-ST Plastic/Cer**	**ST Met/Cer**	**LC-Duplex Plastic/Cer**	**E2,000 Plastic/Cer**	**E2,000HRL Plastic/Cer**
6	9D320003	9D320007	9D320011	9D320014	9D320017	9D320020
12	9D320004	9D320008	9D320012	9D320015	9D320018	9D320002
24	9D320005	9D320009	9D320013	9D320001	9D320019	9D320021
48	9D320006	9D320010	x	9D320016	x	x

Multimode						
No. of Fibers	**SC-Duplex Plastic/PhBz**	**SC-Duplex-ST Plastic/PhBz**	**ST Met/PhBz**	**LC-Duplex Plastic/PhBz**	**E2,000 Plastic/Cer**	**E2,000 Plastic/Cer**
6	9D320022	9D320025	9D320029	9D320032	9D320036	x
12	9D320023	9D320026	9D320030	9D320033	9D320037	x
24	9D320000	9D320027	9D320031	9D320034	9D320038	x
48	9D320024	9D320028	x	9D320035	x	x

other versions available on request

FLine® Smart splice housing

telescopic

Single-mode						
No. of Fibers	**SC-Duplex Plastic/Cer**	**SC-Duplex-ST Plastic/Cer**	**ST Met/Cer**	**LC-Duplex Plastic/Cer**	**E2,000 Plastic/Cer**	**E2,000HRL Plastic/Cer**
6	9D310003	9D310007	9D310011	9D310014	9D310018	9D310021
12	9D310004	9D310008	9D310012	9D310015	9D310019	9D310022
24	9D310005	9D310009	9D310013	9D310016	9D310020	9D310023
48	9D310006	9D310010	x	9D310017	x	x

Multimode 50µ OM2						
No. of Fibers	**SC-Duplex Plastic/PhBz**	**SC-Duplex-ST Plastic/PhBz**	**ST Met/PhBz**	**LC-Duplex Plastic/PhBz**	**E2,000 Plastic/Cer**	
6	9D310024	9D310028	9D310032	9D310035	9D310039	x
12	9D310025	9D310029	9D310033	9D310036	9D310040	x
24	9D310026	9D310030	9D310034	9D310037	9D310041	x
48	9D310027	9D310031	x	9D310038	x	x

Multimode 50µ OM						
No. of Fibers	**SC-Duplex Plastic/PhBz**	**SC-Duplex-ST Plastic/PhBz**	**ST Met/PhBz**	**LC-Duplex Plastic/PhBz**	**E2,000 Plastic/Cer**	
6	9D310042	9D310046	9D310050	9D310053	9D310057	x
12	9D310043	9D310047	9D310051	9D310054	9D310058	x
24	9D310044	9D310048	9D310052	9D310055	9D310059	x
48	9D310045	9D310049	x	9D310056	x	x

Multimode 50µ OM3 e						
No. of Fibers	**SC-Duplex Plastic/PhBz**	**SC-Duplex-ST Plastic/PhBz**	**ST Met/PhBz**	**LC-Duplex Plastic/PhBz**	**E2,000 Plastic/Cer**	
6	9D310060	9D310064	9D310068	9D310071	9D310075	x
12	9D310061	9D310065	9D310069	9D310072	9D310076	x
24	9D310062	9D310066	9D310070	9D310073	9D310077	x
48	9D310063	9D310067	x	9D310074	x	x

Multimode 62.5µ OM1						
No. of Fibers	**SC-Duplex Plastic/PhBz**	**SC-Duplex-ST Plastic/PhBz**	**ST Met/PhBz**	**LC-Duplex Plastic/PhBz**	**E2,000 Plastic/Cer**	
6	9D310078	9D310082	9D310086	9D310089	9D310093	x
12	9D310079	9D310083	9D310087	9D310090	9D310094	x
24	9D310080	9D310084	9D310088	9D310091	9D310095	x
48	9D310081	9D310085	x	9D310092	x	x

other versions available on request

FLine® Smart patch housing

fixed

19" housing, 1 RU

Characteristics:

- Installation of a maximum of 2 fiber optic cables with a maximum total of 48 fibers
- Body of housing made of sheet steel
- Colour of front panel: grey, RAL 7035
- Strain relief for the ready made distribution head on the housing and PG gland for cable entries
- Dust protection
- Splice cassette with coloured pigtails, Gigabit Ethernet fibers (MM)
- Pigtail colour code: E9. . .10/125 according to DIN IEC 60304
  G50/125 according to DIN IEC 60304
  G62.5/125 according to DIN IEC 60304
- Pigtails already inserted into splice cassette
- Height: 44 mm (1 RU)
  Width: 483 mm (19")
  Depth: 230 mm
  Weight: 1.2 kg
- Screen-printed markings: Channel 1-12 / 1-24, A/B coding with SC/ST/FC components

Components:

- Available with up to 24 slots or without components
- The following couplings can be used: SC-Duplex/SC-Duplex
  FC-PC, FC-PC(HRL) (SM)
  ST/ST
  E2000/E2000
  E2000HRL/E2000HRL (SM)
  MT-RJ/MT-RJ (MM)
  LC-Duplex

Accessories:

- Blind plug for front panel, splice protector (maximum of 12 pcs. in one splice cassette)

Single-mode						
No. of Fibers	**SC-Duplex Plastic/Cer**	**SC-Duplex-ST Plastic/Cer**	**ST Met/Cer**	**LC-Duplex Plastic/Cer**	**E2,000 Plastic/Cer**	**E2,000HRL Plastic/Cer**
6	9D420003	9D420006	9D420009	9D420012	9D420014	9D420017
12	9D420004	9D420007	9D420010	9D420013	9D420015	9D420018
24	9D420005	9D420008	9D420011	9D420033	9D420016	9D420002

Multimode						
No. of Fibers	**SC-Duplex Plastic/PhBz**	**SC-Duplex-ST Plastic/PhBz**	**ST Met/PhBz**	**LC-Duplex Plastic/PhBz**	**E2,000 Plastic/Cer**	
6	9D420019	9D420021	9D420024	9D420027	9D420030	x
12	9D420020	9D420022	9D420025	9D420028	9D420031	x
24	9D420000	9D420023	9D420026	9D420029	9D420032	x

other versions available on request

FLine® Smart splice housing

fixed

Single-mode						
No. of Fibers	**SC-Duplex Plastic/Cer**	**SC-Duplex-ST Plastic/Cer**	**ST Met/Cer**	**LC-Duplex Plastic/Cer**	**E2,000 Plastic/Cer**	**E2,000HRL Plastic/Cer**
6	9D410003	9D410007	9D410011	9D410014	9D410018	9D410021
12	9D410004	9D410008	9D410012	9D410015	9D410019	9D410022
24	9D410005	9D410009	9D410013	9D410016	9D410020	9D410023

Multimode 50µ OM2						
No. of Fibers	**SC-Duplex Plastic/PhBz**	**SC-Duplex-ST Plastic/PhBz**	**ST Met/PhBz**	**LC-Duplex Plastic/PhBz**	**E2,000 Plastic/Cer**	
6	9D410024	9D410028	9D410032	9D410035	9D410039	
12	9D410025	9D410029	9D410033	9D410036	9D410040	
24	9D410026	9D410030	9D410034	9D410037	9D410041	

Multimode 50µ OM3						
No. of Fibers	**SC-Duplex Plastic/PhBz**	**SC-Duplex-ST Plastic/PhBz**	**ST Met/PhBz**	**LC-Duplex Plastic/PhBz**	**E2,000 Plastic/Cer**	
6	9D410002	9D410017	9D410038	9D410044	9D410047	
12	9D410006	9D410027	9D410042	9D410045	9D410048	
24	9D410010	9D410031	9D410043	9D410046	9D410049	

Multimode 50µ OM3 e						
No. of Fibers	**SC-Duplex Plastic/PhBz**	**SC-Duplex-ST Plastic/PhBz**	**ST Met/PhBz**	**LC-Duplex Plastic/PhBz**	**E2,000 Plastic/Cer**	
6	9D410050	9D410053	9D410056	9D410059	9D410062	
12	9D410051	9D410054	9D410057	9D410060	9D410063	
24	9D410052	9D410055	9D410058	9D410061	9D410064	

Multimode 62.5µ OM1						
No. of Fibers	**SC-Duplex Plastic/PhBz**	**SC-Duplex-ST Plastic/PhBz**	**ST Met/PhBz**	**LC-Duplex Plastic/PhBz**	**E2,000 Plastic/Cer**	
6	9D410065	9D410068	9D410071	9D410074		
12	9D410066	9D410069	9D410072	9D410075		
24	9D410067	9D410070	9D410073	9D410076		

Other versions available on request

FLine® Hybrid

FLine® Hybrid was developed for special system applications in SANs, LANs and Data Centres where combined fiber optic and copper cabling is used.
The Hybrid panel has a high packing density and is easy to mount. The basic housing was designed to accommodate up to four modular ELine 250® RJ, ELine 500® RJ or EC7 jacks and up to 12 x SC-Duplex and up to 12 x LC-Duplex couplings. An optional splice cassette holder allows the entry and processing of up to 24 fiber pigtails.

The FLine® Hybrid system combines the advantages of fiber optic and copper cabling.

FO: high bandwidths
long ranges

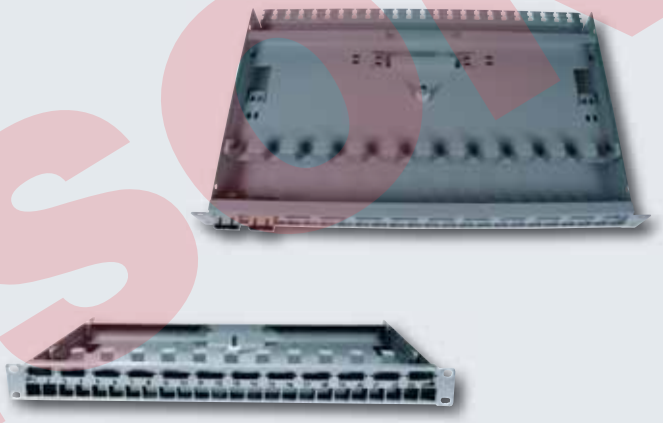
Copper: for data and telecommunications
(conventional/Voice over IP)
Power over Ethernet

Characteristics:

- Compact design 1 RU
- The front panel is light grey, RAL 7035
- Exchangeable front panel
- The front panel can be equipped with up to 24 x ELine 250® RJ, 24 x ELine 500® and 24 x EC7
- 12 x SC-Duplex, 12 x LC-Duplex
- The couplings are premounted
- Front panel with combined screen-printed 1-24 for jacks and couplings
- The body of the housing is made of sheet steel

Optional splice insert:

- The splice insert is detachable
- Up to two splice cassettes with 12 fibers each can be inserted
- Splice cassettes with pigtails already included and ready for splicing
- Pigtails are marked (primary and secondary coating) according to the DIN IEC 60304 colour code
- The result is rapid, safe assembly as it is no longer necessary to mark the individual pigtails



FLine® Hybrid housings:

Front panel with:	SC-DX	LC-DX
Housing	9FJZ0004	9FJZ0055
Splice insert	9FZZ0189	9FZZ0189

Housing equipped with FO couplings and fiber pigtails:

Single-mode E9…10/125, insertion losses: < 0.4 dB; return losses: >40 dB					
No. of Fibers	**SC-DX (Met/Cer)**	**SC-DX (Plastic/Cer)**	**SC-DX (Plastic/PhBz)**	**LC-DX (Plastic/Cer)**	**LC-DX (Plastic/PhBz)**
6	9FJ90304	9FJ90303	9FJ90305	9FJ90355	9FJ90356
12	9FJ90604	9FJ90603	9FJ90605	9FJ90655	9FJ90656
24	9FJ91204	9FJ91203	9FJ91205	9FJ91255	9FJ91256

FLine® 150, multimode G50/125 OM2e, insertion losses: < 0.4 dB; return losses: >25 dB					
No. of Fibers	**SC-DX (Met/Cer)**	**SC-DX (Plastic/Cer)**	**SC-DX (Plastic/PhBz)**	**LC-DX (Plastic/Cer)**	**LC-DX (Plastic/PhBz)**
6	9FJ90304	9FJ90303	9FJ90305	9FJ90355	9FJ90356
12	9FJ90604	9FJ90603	9FJ90605	9FJ90655	9FJ90656
24	9FJ91204	9FJ91203	9FJ91205	9FJ91255	9FJ91256

FLine® 300, multimode G50/125 OM3: insertion losses: < 0.2 dB; return losses: >35 dB					
No. of Fibers	**SC-DX (Met/Cer)**	**SC-DX (Plastic/Cer)**	**SC-DX (Plastic/PhBz)**	**LC-DX (Plastic/Cer)**	**LC-DX (Plastic/PhBz)**
6	9FJB0304	9FJB0303	9FJB0305	9FJB0355	9FJB0356
12	9FJB0604	9FJB0603	9FJB0605	9FJB0655	9FJB0656
24	9FJB1204	9FJB1203	9FJB1205	9FJB1255	9FJB1256

FLine® 550, multimode G50/125 OM3"e": insertion losses: < 0.2 dB; return losses: >35 dB					
No. of Fibers	**SC-DX (Met/Cer)**	**SC-DX (Plastic/Cer)**	**SC-DX (Knst/PhB z)**	**LC-DX (Plastic/Cer)**	**LC-DX (Plastic/PhBz)**
6	9FJD0304	9FJD0303	9FJD0305	9FJD0355	9FJD0356
12	9FJD0604	9FJD0603	9FJD0605	9FJD0655	9FJD0656
24	9FJD1204	9FJD1203	9FJD1205	9FJD1255	9FJD1256

Multimode G62.5/125 OM1, standard: insertion losses: < 0.4 dB; return losses: >25 dB					
No. of Fibers	**SC-DX (Met/Cer)**	**SC-DX (Plastic/Cer)**	**SC-DX (Plastic/PhBz)**	**LC-DX (Plastic/Cer)**	**LC-DX (Plastic/PhBz)**
6	9FJ60304	9FJ60303	9FJ60305	9FJ60355	9FJ60356
12	9FJ60604	9FJ60603	9FJ60605	9FJ60655	9FJ60656
24	9FJ61204	9FJ61203	9FJ61205	9FJ61255	9FJ61256

Other components available on request

FLine® Compact

high packing density and maximum flexibility

FLine® Compact is a user-friendly fiber optic cable patch system to hold a maximum of up to 144 fibers with conventional couplings like SC, ST, E 2,000 and even 240 fibers with LC and 288 fibers with MT-RJ.
In spite of its compactness, the system offers optimum fiber optic cable management. FLine® Compact is used when there is little room and maximum flexibility is required (computer centres, subnetworks).

Component chassis with cable management bar 3+1 RU

- Width: 19" / 84 DU
- Height: 3 + 1 RU (component chassis + cable management bar)
- Can be equipped with up to 12 modules
- The cable management bar can be pulled out to the front or the rear, takes up the filled loose tube reserve loops and serves to fix the fiber optic cables
- Patch panel for patch cord guide and compliance with the bending radii

Compact module 3 RU, 7 DU / 3 RU, 8 DU

- For a maximum of 24 fibers
- Available with 4, 8 or 12 slots
- Equipped with SC-Duplex, ST, E2000, FC-PC, MT-RJ, LC-Duplex or unequipped
- Body of housing: sheet steel
- Front panel: aluminium, with fixing screws
- Incl. splice cassette and cable management bar
- The pigtails are inserted, plugged into couplings and coloured (primary and secondary coating) ready for splicing according to the colour code according to DIN IEC 60304 for rapid and reliable installation
- Fiber qualities: OS1, OM2e, OM3, OM3e
- The couplings can be mounted at any time later
- Accessories: blind plug for front panel, crimp splice protection

Component chassis with mounted cable management bar, 3+1 RU

Component chassis

Product description::

- 19" component chassis, 3 RU, 84 DU, mounted and unequipped
- Body of housing und front panel made of aluminium

Article no.
9D500000

Cable management bar

Product description::

- 19", 1 RU
- Front panel with patch cord guide/cable management bar for clear organization of the filled loose tube reserve loops and fastening
- The cable management bar can be pulled out to the front or the rear
- Completely mounted incl. fastening material
- Depth: 295 mm

FLine® Compact

Compact modules for ready-made breakout cables

Single-mode						
No. of Fibers	**SC-Duplex Plastic/Cer**	**SC-Duplex - ST Plastic/Cer**	**ST Met/Cer**	**LC-Duplex Plastic/Cer**	**E2,000 Plastic/Cer**	**E2,000HRL Plastic/Cer**
6	9D520000	9D520003	9D520006	9D520008	9D520011	9D520013
12	9D520001	9D520004	9D520007	9D520009	9D520012	9D520014
24				9D520010		

Multimode						
No. of Fibers	**SC-Duplex Plastic/PhBz**	**SC-Duplex - ST Plastic/PhBz**	**ST Met/PhBz**	**LC-Duplex Plastic/PhBz**	**E2,000 Plastic/Cer**	
6	9D520016	9D520019	9D520022	9D520024	9D520027	
12	9D520017	9D520020	9D520023	9D520025	9D520028	
24				9D520026		

Other components available on request

Compact modules for splicing

Single-mode						
No. of Fibers	**SC-Duplex Met/Cer**	**SC-Duplex Plastic/Cer**	**ST Met/Cer**	**LC-Duplex Plastic/Cer**	**E2,000 Plastic/Cer**	**E2,000HRL Plastic/Cer**
6	9D510003	9D510084	9D510007	9D510010	9D510014	9D510017
12	9D510036	9D510085	9D510008	9D510011	9D510015	9D510001
24				9D510012		

Multimode 50µ OM2						
No. of Fibers	**SC-Duplex Met/PhBz**	**SC-Duplex Plastic/PhBz**	**ST Met/PhBz**	**LC-Duplex Plastic/PhBz**	**E2,000 Plastic/Cer**	
6	9D510020	9D510023	9D510026	9D510029	9D510033	
12	9D510021	9D510024	9D510027	9D510030	9D510034	
24				9D510031		

Multimode 50µ OM3						
No. of Fibers	**SC-Duplex Met/PhBz**	**SC-Duplex Plastic/PhBz**	**ST Met/PhBz**	**LC-Duplex Plastic/PhBz**	**E2,000 Plastic/Cer**	
6	9D510013	9D510039	9D510042	9D510045	9D510049	
12	9D510037	9D510040	9D510043	9D510046	9D510050	
24				9D510047		

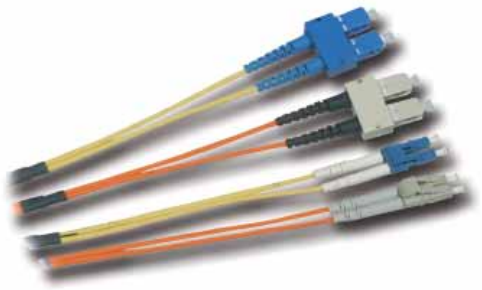
Multimode fixed 50µ OM3 e						
No. of Fibers	**SC-Duplex Met/PhBz**	**SC-Duplex Plastic/PhBz**	**ST Met/PhBz**	**LC-Duplex Plastic/PhBz**	**E2,000 Plastic/Cer**	
6	9D510052	9D510055	9D510058	9D510061	9D510065	
12	9D510053	9D510056	9D510059	9D510062	9D510066	
24				9D510063		

Multimode fixed 62.5µ OM1						
No. of Fibers	**SC-Duplex Met/PhBz**	**SC-Duplex Plastic/PhBz**	**ST Met/PhBz**	**LC-Duplex Plastic/PhBz**	**E2,000 Plastic/Cer**	
6	9D510068	9D510071	9D510074	9D510077	9D510019	
12	9D510069	9D510072	9D510075	9D510078	9D510081	
24				9D510079		

Other components available on request

FLine® patch cords

Duplex connecting cable/Duplex adapter cable



Description
FO patch cables in the versions connecting cable and adapter cable. The standard version of the connecting cables is the crossed version. In the case of SC-Duplex, it is possible to rotate the plug (clip can be opened).

Plug:
SC-Duplex according to IEC 61754-4
LC-Duplex according to IEC 61754-20
ST according to IEC 61754-2

Characteristics:
Single-mode-standard E9/125: insertion losses < 0.4 dB; return losses >40 dB
FLine® 150 G50/125 OM2: insertion losses < 0.4 dB; return losses >25 dB
FLine® 300 G50/125OM3: insertion losses < 0.2 dB; return losses > 35 dB
FLine® 550 G50/125 OM3e: insertion losses < 0.2 dB; return losses > 35 dB
Multimode G62.5/125: insertion losses < 0.4 dB; return losses> 25 dB

FLine® FO-Duplex connecting cables

SC-Duplex – SC-Duplex		
Length	**E09/125µm**	**G50/125µm**
0.5	9A130200	9A110200
1.0	9A130201	9A110201
1.5	9A130202	9A110202
2.0*	9A130203	9A110203
2.5	9A130204	9A110204
3.0*	9A130205	9A110205
5.0*	9A130206	9A110206
7.5	9A130207	9A110207
10.0	9A130208	9A110208

LC-Duplex – LC-Duplex		
Length	**E09/125µm**	**G50/125µm**
0.5	9A130218	9A110219
1.0	9A130219	9A110220
1.5	9A130220	9A110221
2.0	9A130221	9A110222
2.5	9A130222	9A110223
3.0	9A130223	9A110224
5.0	9A130224	9A110225
7.5	9A130225	9A110226
10.0	9A130226	9A110227

ST – ST		
Length	**E09/125µm**	**G50/125µm**
0.5	9A130236	9A110237
1.0	9A130237	9A110238
1.5	9A130238	9A110239
2.0	9A130239	9A110240
2.5	9A130240	9A110241
3.0	9A130241	9A110242
5.0	9A130242	9A110243
7.5	9A130243	9A110244
10.0	9A130244	9A110245

FLine® FO-Duplex connecting cables

SC-Duplex – ST		
Length	**E09/125µm**	**G50/125µm**
0.5	9A130227	9A110228
1.0	9A130228	9A110229
1.5	9A130229	9A110230
2.0	9A130230	9A110231
2.5	9A130231	9A110232
3.0	9A130232	9A110233
5.0	9A130233	9A110234
7.5	9A130234	9A110235
10.0	9A130235	9A110236

SC-Duplex – LC-Duplex		
Length	**E09/125µm**	**G50/125µm**
0.5	9A130209	9A110210
1.0	9A130210	9A110211
1.5	9A130211	9A110212
2.0	9A130212	9A110213
2.5	9A130213	9A110214
3.0	9A130214	9A110215
5.0	9A130215	9A110216
7.5	9A130216	9A110217
10.0	9A130217	9A110218

LC-Duplex – ST		
Length	**E09/125µm**	**G50/125µm**
0.5	9A130245	9A110246
1.0	9A130246	9A110247
1.5	9A130247	9A110248
2.0	9A130248	9A110249
2.5	9A130249	9A110250
3.0	9A130250	9A110251
5.0	9A130251	9A110252
7.5	9A130252	9A110253
10.0	9A130253	9A110254

Other components available on request

FLine® office and floor distributors –

multifunctional housings for FTTD/FTTO cabling

Network installations are increasingly being implemented with disturbance-proof fiber optic systems technology with future capabilities.

This allows EMC problems and different earthing potentials in cablings installed throughout the whole building to be avoided.

When a fiber optic cabling with a star structure is used in a building, the long ranges involved make it possible to dispense with active components on the individual floors.

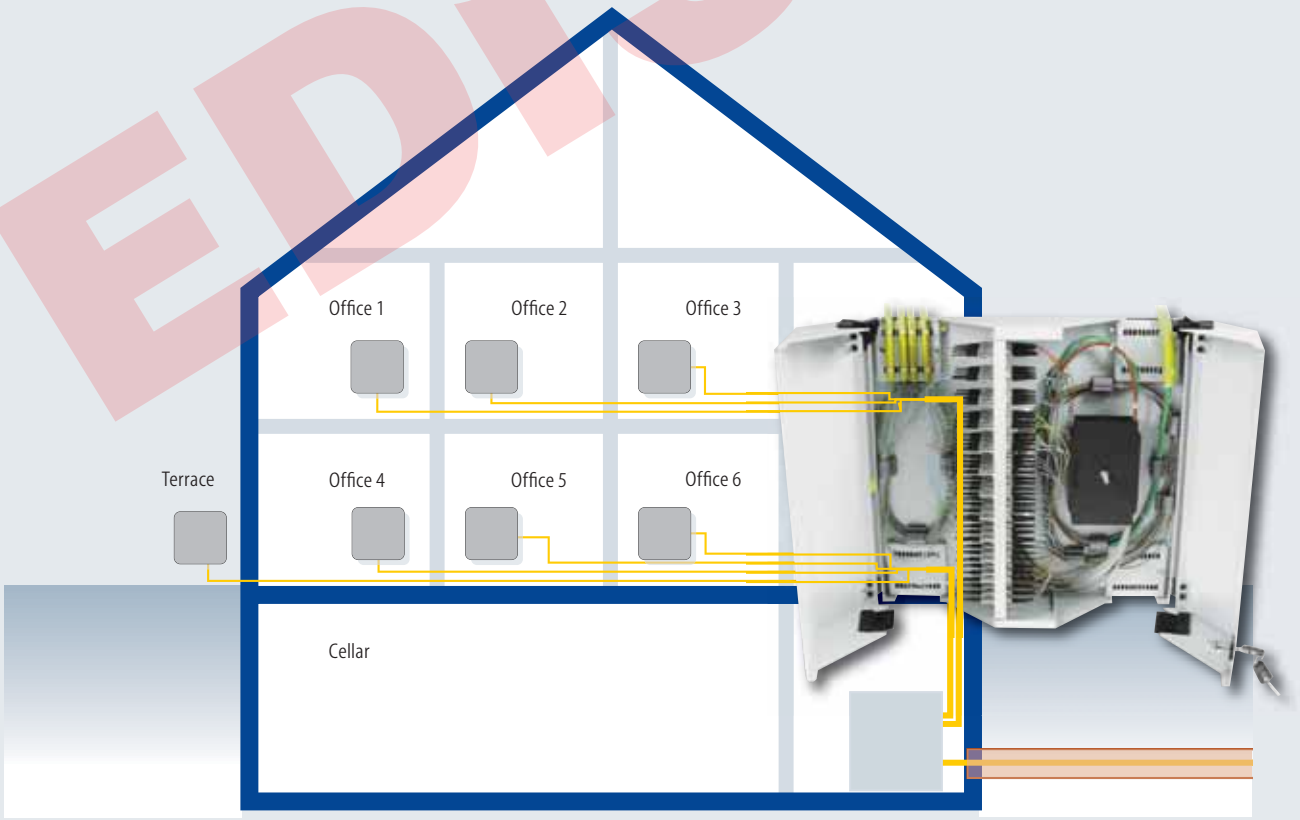
19" distributor cabinets and separate security areas (rooms) are no longer necessary.

The space-saving office and floor cables are perfectly suited for the transitions from high-fiber backbone cables to breakout cables for workplace cabling.

They are easy to install and offer space-saving organisation and optimum protection for FO systems engineering.

Characteristics which ensure a high degree of flexibility

- The FLine® office and floor distributors can be optionally equipped with splice cassettes and/or distributor plates for taking up fiber optical couplings
- Later modifications to the components used are possible at any time
- Takes up a maximum of up to 288 fibers
- The pigtails are coloured (primary and secondary coating) according to the DIN IEC 60304 colour code for safe and reliable installation
- The pigtails in the splice cassette are ready for splicing
- The arriving and departing fiber optic cables are fixed to a strain relief strip in the housing
- The cable entries are sealed via brush strips or PG glands
- Housing with two pivoted doors, lockable
- Housing colour: light grey, RAL 7035



FLine® office and floor distributors

Housing size A

Coupling panel

Cable entry modules

Product description

Size A: 300 x 300 x 85 mm
Can be equipped with:
- Up to 4 splice cassettes with a total of 48 fibers
- One integrated coupling panel can be equipped with up to 48 couplings for fiber optic connectors
- Optionally, 2 different cable entry modules can be used (1 x at top and 1 x at bottom)
- light grey, RAL 7035

Size B: 600 x 425 x 220 mm
Can be equipped with:
- Up to 12 splice cassettes with a total of 144 fibers
- One integrated coupling panel can be equipped with up to 96 couplings for fiber optic plug connectors
- Optionally, 4 different cable entry modules can be used (2 x at top and 2 x at bottom)
- light grey, RAL 7035

In general:
- Optionally, 4 different cable entry modules can be used (2 x at top at 2 x at bottom)
  – Brush strip
  – 2 x PG 16
  – 2 x PG 21

Scope of delivery:
- Fiber optic wall distributor/splice box housing empty, without cable entry modules with standard closing cylinder

Accessories:
- Coupling panel to take up ST, SC-Duplex, E 2,000, LC-Duplex, MT-RJ
- Splice cassette with holder and cover
- Pigtails
- Crimp/shrink splice protector
- Cable guide bar with velcro® band
- Dummy plates

Office/wall distributor/ splice box	Article no.	Office/wall distributor/ splice box	Article no.
Size A: 300 x 300 x 85 mm Housing empty	9D700000	**Size B:** 600 x 425 x 220 mm Housing empty	9D700001

Coupling panel	Article no.	Coupling panel	Article no.
for a max. of 24 x SC-Duplex	9D0000000	for a max. of 72 x SC-Duplex	9D0000003
for a max. of 24 x ST 24 x FC-PC	9D0000001	for a max. of 144 x ST 144 x FC-PC	9D0000004
for a max. of 24 x E 2,000 24 x LC-Duplex 24 x MT-RJ	9D0000002	for a max. of 72 x E 2,000 72 x LC-Duplex 72 x MT-RJ	9D000100

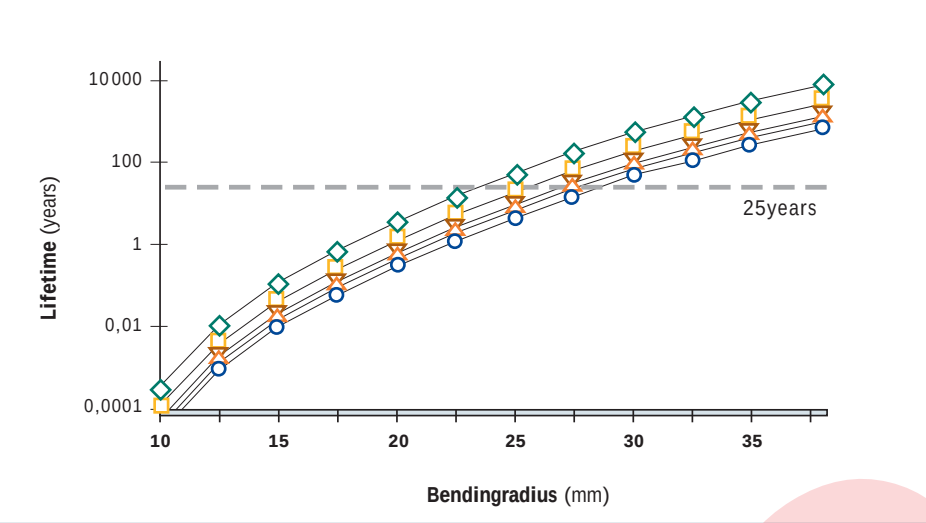
Couplings			
Multimode	**Article no.**	**Single-mode**	**Article no.**
SC-Duplex	9D000012	SC-Duplex	9D000006
ST	9D000014	ST	9D000013
LC-Duplex	9D000017	LC-Duplex	9D000015
E 2000		LC-Duplex APC	9D000016
MT-RJ	9D000018	E 2,000	9D000065
FC-PC	9D000021	FC-PC	9D000019

Accessories:	**Article no.**
Cable entry module with 2 PG 16 glands	9D000024
Cable entry module with 2 PG 21 glands	9D000025
Brush strip	9D000026
Dummy plate	9D000027
Cable guide bar with velcro® band	9D000028
Splice cassette with crimp splice protection holder	9D000030
Cover for the splice cassette	9D000031
Splice protector	9D000032
Splice cassette holder	9D000029

Splice cassettes with inserted pigtails	**Article no.**
FLine® 150, multimode G 50/125, insertion losses < 0.4 dB; return losses > 25 dB "OM2e"	
Splice cassette with 12 x SC pigtails	9D000036
Splice cassette with 12 x ST pigtails	9D000048
Splice cassette with 12 x LC pigtails	9D000042
Splice cassette with 12 x E 2000 pigtails	9D000053
Splice cassette with 12 x FC-PC pigtails	9D000059
FLine® 300, multimode G 50/125, nsertion losses < 0.2 dB; return losses > 35 dB "OM3"	
Splice cassette with 12 x SC pigtails	9D000037
Splice cassette with 12 x LC pigtails	9D000043
FLine® 550, multimode G 50 / 125 , insertion losses < 0.2 dB; return losses > 35 dB "OM3e "	
Splice cassette with 12 x SC pigtails	9D000038
Splice cassette with 12 x LC pigtails	9D000044
Single-mode E 9...10/125, insertion losses < 0.4 dB, return losses > 40 dB	
Splice cassette with 12 x SC pigtails	9D000039
Splice cassette with 12 x ST pigtails	9D000031
Splice cassette with 12 x LC pigtails	9D000045
Splice cassette with 12 x E 2,000 HRL pigtails	9D000057
Splice cassette with 12 x E 2,000 pigtails	9D000056
Splice cassette with 12 x FC-PC pigtails	9D000062

FLine® – the complete system

for fiber-to-the-desk



Compact fiber optical connection engineering – high performance, immunity to disturbances, future capabilities

Of course, the FLine® system also includes comprehensive connectivity solutions for fiber-to-the-desk. Here it is possible to use a wide range of outlets with the corresponding materials for installation in ducts and floorbox solutions.

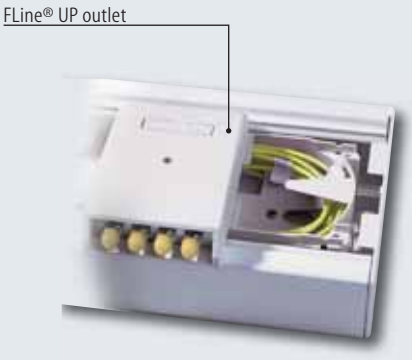
As a result of a specific outlet design, bending never goes below the admissible bending radii of the fibers, thus ensuring that the fiber keeps its full functionality even in the long term.

- A defined bending radius of the fiber ensures the lifetime
- An effective strain relief for cables and pigtails and clean guidance within the outlet ensure minimum strain on the fiber and preservation of the physical characteristics
- The dimensions of the outlets are as small as possible

FLine® UP outlet

The UP outlet can be installed in ducts or concealed mounting can be used. The special features of this professional version are as follows:

- It can be equipped with up to two duplex or 4 simplex couplings
- Possible types of coupling: SC-Duplex, ST-Simplex, E 2,000, LC-Duplex
- The bending radius of the fiber of at least 30 mm is ensured by the cable reservoir and the cable guide
- The outlet has a downward inclination of 10°. This ensures optimum protection against mechanical stress
- The universal carrying frame is compatible with usual mounting cups
- All current connecting techniques are supported:
  - Mounting of fiber optical plugs on location
  - Use of ready-made cables
  - Splicing of pigtails



FLine® outlets

FLine® UP outlet

Product description:

- For mounting in parapet ducts and for underfloor mounting
- Termination of up to 4 fibers
- Outlet direction: downwards at an angle of 10°
- Bending radius > 30 mm in conjunction with cable reservoir KR or cable guide KF
- Marking insert enclosed
- Delivery: Equipped with 2 SC-Duplex couplings
- Colour: pearl white, RAL 1013

Article no.
9FK03006
Pcs. per packing unit: 1

FLine® cable reservoir CR

Product description:

- For UP jack to take up excessive cable lengths and/or safety reserves (at least 4 x 1 m at an external diameter of 3 mm)
- Minimum bending radius > 30 mm
- Direction-independent cable entry with cable tie strain relief on input and output side
- Dimensions: 151 x 76 x 50 / 55 mm (WxHxD)
- Installation height 50 mm (CR50)
- Installation height 55 mm (CR55)

Article no.
9FK03007 (CR50)
9FK03008 (CR55)
Pcs. per packing unit: 1

FLine® splice tray for cable reservoir CR

Product description:

- For storing FO splices when splicing plug pigtails
- The separate storage of splice reserve and working reserve protects the sensitive splice area
- Can be equipped with one or two splice holders for four fusion splices or mechanical splice connectors
- Snaps into cable reservoir CR

Article no.
9FK03029
Pcs. per packing unit: 1

EK outlet

The advantage of the installation duct is its compact design. It can be installed in ducts in a horizontal or vertical position.

The EK outlet has the following characteristics:

- It can be equipped with up to one duplex coupling or two simplex couplings
- Possible types of coupling: SC-Duplex, ST-Simplex, E 2,000, LC-Duplexi
- The integrated cable guide ensures that the minimum bending radius is complied with
- The universal central piece can be combined with various different switch programs
- Cables with pre-fitted plugs as well as plugs mounted on location can be used

FLine® EK outlet

FLine® outlets

FLine® EK outlet

Product description:

- For horizontal and vertical mounting in parapet ducts, termination of 1 channels/2 fibers
- Outlet direction: downwards at an angle of 45°, defined bending radius in conjunction with suitable assembly holder MH
- Cable tie strain relief
- Central piece 50 x 50 mm according to DIN 41075 Part 1, 1989
- Colour: pearl white, RAL 1013

Article no.
9FK03050
Pcs. per packing unit: 1

FLine® assembly holder MH

Product description:

- For EK or UP outlet in conjunction with cable guide KF
- Horizontal mounting
- Suitable for all Tehalit duct systems and Ackermann
- Te li ko (WIK + SIS)
- Installation height 50 mm
- Installation height 55 mm

Article no.	Installation height
9FK03014	50 mm
9ZK03015	55 mm
Pcs. per packing unit: 10	

FLine® assembly holder MH

Product description:

- For EK or UP outlet in conjunction with cable guide KF
- Vertical installation
- Suitable for all Tehalit duct systems and Ackermann
- Te li ko (WIK + SIS)
- Installation height 50 mm
- Installation height 55 mm

Article no.	Installation height
9FK03016	50 mm
9ZK03017	55 mm
Pcs. per packing unit: 10	

Designation, coupling	Article no.	Designation, coupling	Article no.	Designation, coupling	Article no.
ST/ST Single-mode, ceramic	9FK03010	ST/ST Multimode, ceramic	9FK03043	ST/ST Multimode, PhBz	9FK03046
SC/ST Single-mode, ceramic	9FK03011	SC/ST Multimode, ceramic	9FK03044	SC/ST Multimode, PhBz	9FK03047
SC/SC Single-mode, ceramic	9FK03012	SC/SC Multimode, ceramic	9FK03045	SC/SC Multimode, PhBz	9FK03048

Installation systems for Ackermann floorbox GES 6 and GES 9

More and more frequently, modern office infrastructures are being based on flexible underfloor systems (double floors, duct systems). LEONI Kerpen has followed the leading manufacturers of these systems and developed suitable connecting components.

Product description:

- The mounting cup is suitable for up to 4 x SC-Duplex, 4 x E 2,000, 4 x MT-RJ and 4 x LC-Duplex couplings
- The device cup consists of 1.5 mm sheet steel
- Surface powder-coated black, RAL 9005
- Self-adhesive marking strips for marking as required

FLine® Floorbox solutions for ready-made cables

FLine® device cup (dual)

Product description:
- For taking up the mounting plates for fiber optic couplings
- For Ackermann floorboxes GES 6

Article no.
9ZE60001
Pcs. per packing unit: 1

FLine® device cup (triple)

Product description:
- For taking up the mounting plates for fiber optic couplings (as in examples on top right)
- For Ackermann floorboxes GES 6

Article no.
9ZE60002
Pcs. per packing unit: 1

FLine® adjustable cable strain relief

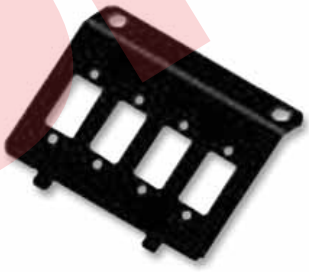
Product description:
- For up to 9 individual cables

Article no.
9ZE60004
Pcs. per packing unit: 1

FLine® mounting plate

Product description:
- For up to 4 x SC-Duplex couplings

Article no.
9FZZ0078
Pcs. per packing unit: 1



FLine® mounting plate

Product description:
- For up to
  4 x LC/Duplex and/or
  4 x E 2,000 Simplex

Article no.
9FZZ0079
Pcs. per packing unit: 1

Floorbox solutions for splices (pigtails)

FLine® cable management module

Product description:

- For storing the wires and for the strain relief of the fiber optic cables

Article no.
GES 9: 9FZZ0018
GES 6: 9FZZ0080
Pcs. per packing unit: 1

FLine® splice tray with splice holder

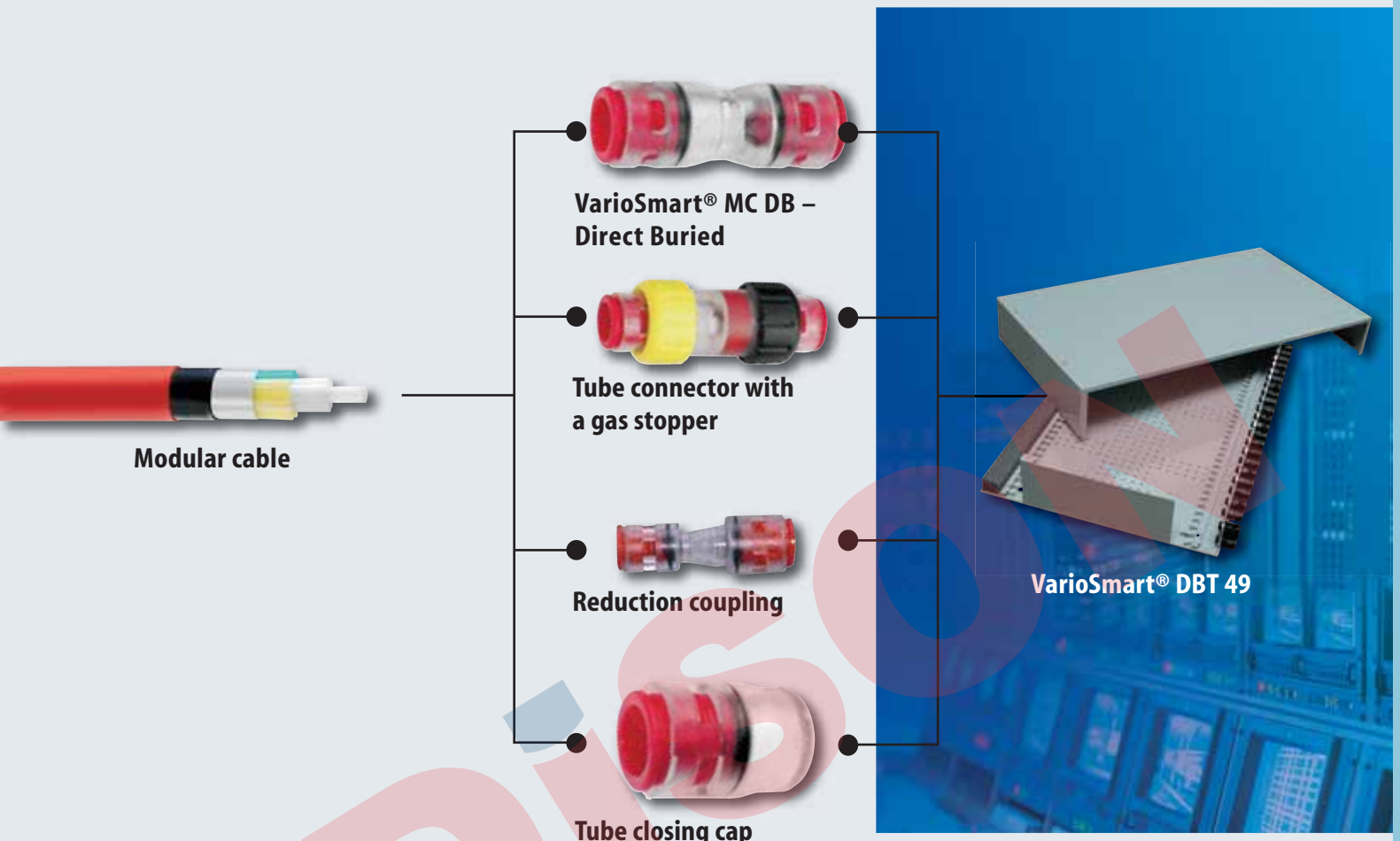
Product description:

- For 12 x splice protector

Article no.
GES 9: 9FZZ0081
GES 6: 9FZZ0020
Pcs. per packing unit: 1

VarioSmart® –

The flexible loose tube system with a secure future



VarioSmart®

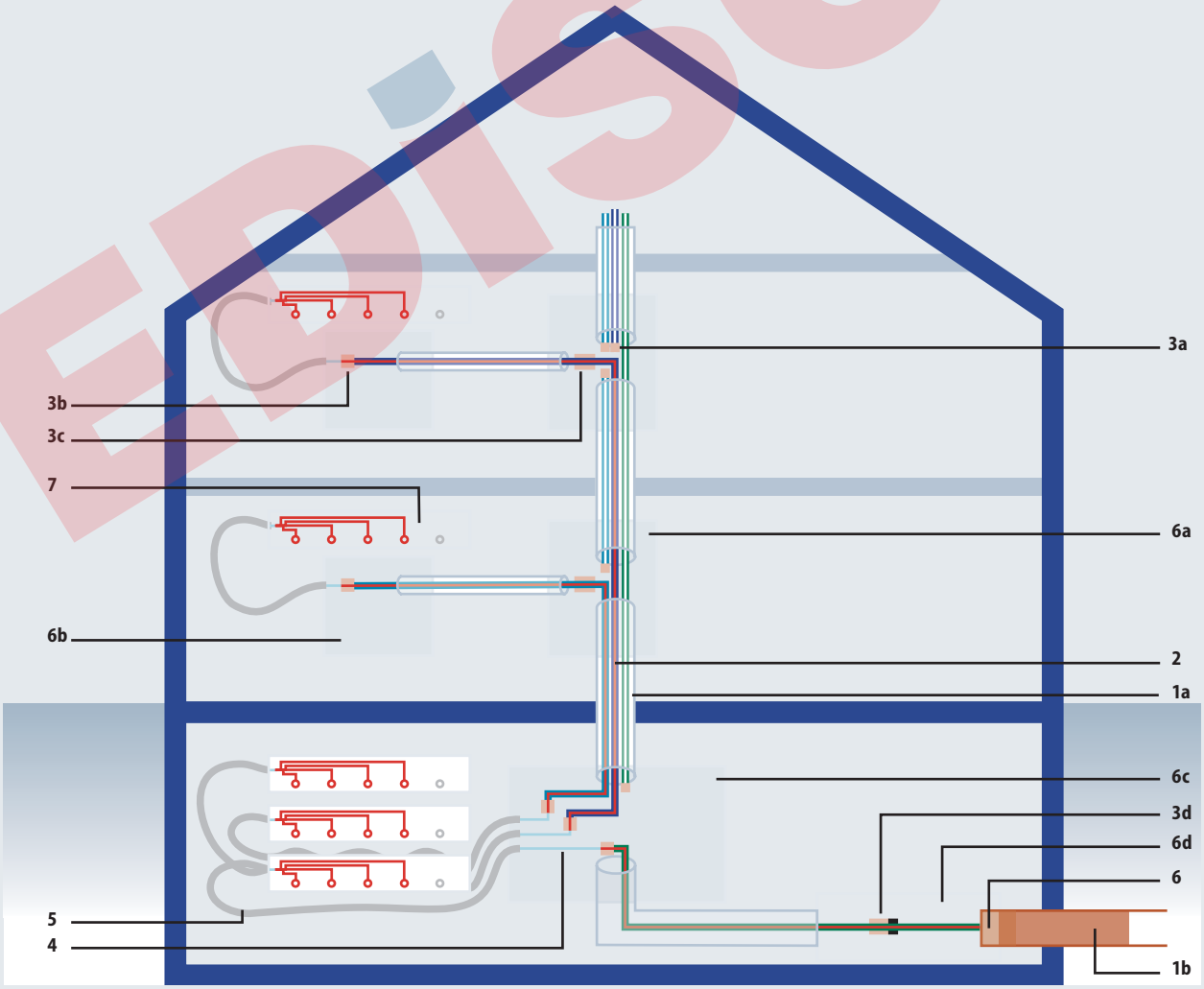
The flexible loose tube system with a secure future

The VarioSmart® system is a flexible loose tube system into which the necessary number of fibers of the required type can be inserted using compressed air as required.
It thus allows uncomplicated, step-by-step extension of the network with minimum changes to the existing VarioSmart® cabling.
As this is a loose tube system, it allows fibers to be inserted quickly and unproblematically precisely when they are needed ("just in time" installation) – or extensions or changes to be made without the necessity of carrying out structural modifications. Fibers or mini cables can be re-used after being blown out of the loose tube.

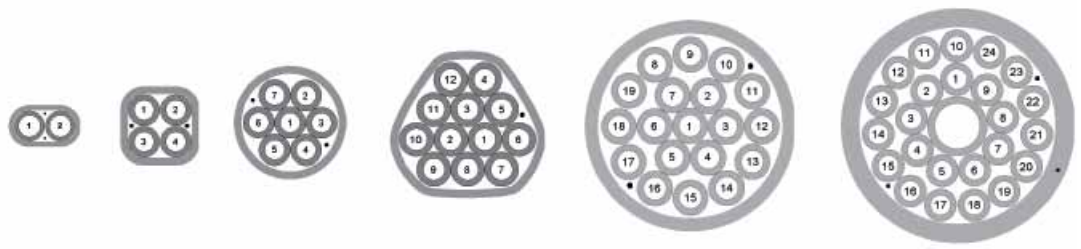
The multiple use of VarioSmart® cables for different applications and the simple making of connections and branches helps to limit the number of splices and links used. Splice-free connections allow error sources and losses in the channel to be reduced.

Various topologies (ring or star incl. redundancies) with different fiber types can be implemented in a cabling in an optimum way.

The VarioSmart® system allows a maximum of flexibility and a secure future. Throughout the entire lifetime of the cabling system, you are able to make changes and extensions which could not be taken into account in planning as a result of the technical developments.



VarioSmart® – system overview



Tubes / cables	2	4	7	12	19	24
VarioSmart® 500 System	The cables with 5 mm tubes can take up fiber units with up to 12 fibers per tube. The 24x cable has a 10 mm central tube into which an additional mini cable with a maximum of 72 fibers can be inserted. Lengths which can be blown in: 750 m to 1,000 m (depending on the number of fibers and the fiber unit)					
Max. number of fibers / cables	24	48	84	144	228	288 + 72

Tubes / cables	2	4	7	12	19	24
VarioSmart® 1000 System	The cables with 10 mm tubes can take up mini cables with up to 72 fibers per tube. Lengths which can be blown in: up to 1,000 m					
Max. number of fibers / cables	144	288	504	–	–	–

Legend for practical example:

Modular cables for all applications

[1a] VarioSmart® MC LFH (Low Fire Hazard) for the in-house area

Structure:

- Microtube 5 mm
- Outer sheath: halogen-free, flame-retardant
- Ripcord under the outer sheath
- Sheath colour: white

Application:

- Installation in the in-house area

VarioSmart® 500 System					
Article no.	**Name of article**	**Overall diameter**	**Weight**	**Min. bending radius**	**Max. tensile force**
8G165102	VarioSmart® 500 MC LFH 2x	12.2 x 7.2 mm	82 g /m	150 mm	0.25 kN
8G165104	VarioSmart® 500 MC LFH 4x	12.2 mm	123 g /m	150 mm	0.5 kN
8G165107	VarioSmart® 500 MC LFH 7x	17.2 mm	190 g /m	220 mm	0.65 kN
8G165112	VarioSmart® 500 MC LFH 12x	22.7 mm	288 g /m	320 mm	1.0 kN
8G165119	VarioSmart® 500 MC LFH 19x	27.5 mm	445 g /m	400 mm	1.5 kN
8G165124	VarioSmart® 500 MC LFH 24x	32.5 mm	591 g /m	500 mm	1.8 kN

VarioSmart® MC DI Direct Install – for the outdoor area

Structure:

- Microtube 5 mm or 10 mm with good sliding behaviour
- Layered sheath: Aluminium foil (150µm) with MDPE sheath
- Ripcord under the outer sheath
- Sheath colour: black

Application:

- Installation in conduits or on carrier systems

VarioSmart® 500 System

Article no.	Name of article	Overall diameter	Weight	Min. bending radius	Max. tensile force
8G165202	VarioSmart® 500 MC DI 2x	13.5 x 8.5 mm	80 g /m	185 mm	0.8 kN
8G165204	VarioSmart® 500 MC DI 4x	15.7 mm	123 g /m	200 mm	1.0 kN
8G165207	VarioSmart® 500 MC DI 7x	18.6 mm	168 g /m	240 mm	1.5 kN
8G165212	VarioSmart® 500 MC DI 12x	23.9 mm	248 g /m	320 mm	2.0 kN
8G165219	VarioSmart® 500 MC DI 19x	28.6 mm	375 g /m	375 mm	2.5 kN
8G165224	VarioSmart® 500 MC DI 24x	33.4 mm	437 g /m	500 mm	4.0 kN

VarioSmart® 1000 System

Article no.	Name of article	Overall diameter	Weight	Min. bending radius	Max. tensile force
8G160202	VarioSmart® 1000 MC DI 2x	–	–	–	–
8G160204	VarioSmart® 1000 MC DI 4x	–	–	–	–
8G160207	VarioSmart® 1000 MC DI 7x	33.4 mm	368 g /m	500 mm	2.5 kN

[1b] VarioSmart® MC DB (Direct Buried) for direct burying

Structure:

- Microtube ø 5mm or 10 mm with good sliding behaviour
- Layered sheath: Aluminium foil (150µm) with MDPE sheath, colour: black
- Outer sheath: HDPE
- Ripcord under the outer sheath
- Colour of outer sheath: orange

Application:

- Installation directly in the earth or in conduits

VarioSmart® 500 System

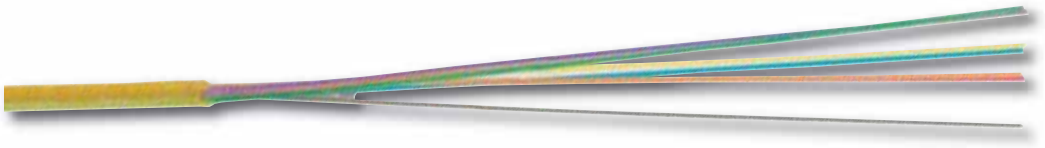
Article no.	Name of article	Overall diameter	Weight	Min. bending radius	Max. tensile force
8G165302	VarioSmart® 500 MC DB 2x	17.2 x 12.2 mm	154 g /m	220 mm	1.2 kN
8G165304	VarioSmart® 500 MC DB 4x	19.3 mm	216 g /m	300 mm	1.5 kN
8G165307	VarioSmart® 500 MC DB 7x	22.2 mm	278 g /m	350 mm	2.0 kN
8G165312	VarioSmart® 500 MC DB 12x	28.2 mm	411 g /m	430 mm	2.8 kN
8G165319	VarioSmart® 500 MC DB 19x	32.2 mm	526 g /m	550 mm	4.0 kN
8G165324	VarioSmart® 500 MC DB 24x	37.8 mm	671 g /m	650 mm	5.0 kN

VarioSmart® 1000 System

Article no.	Name of article	Overall diameter	Weight	Min. bending radius	Max. tensile force
8G160302	VarioSmart® 1000 MC DB 2x	27.2 x 17.2 mm	369 g/ m	220 mm	2.0 kN
8G160304	VarioSmart® 1000 MC DB 4x	31.9 mm	450 g/ m	350 mm	3.0 kN
8G160307	VarioSmart® 1000 MC DB 7x	37.8 mm	602 g/ m	500 mm	4.0 kN

Fiber units and mini cables

[2] Enhanced Performance Fiber Unit (EPFU)



Structure:

- Numbers of fibers: 2, 4, 8 or 12
- Coated fiber bundle with good sliding behaviour
- Colour: yellow

Application:

- For blowing into VarioSmart® cables

Article no.	Name of article	Overall diameter	Weight	Min. bending radius
Multimode 62.5/125 OM1				
8G161102	VarioSmart® Fiber Unit MM 62.5/125 OM1, 2x	1.0 mm	1.0 g /m	50 mm
8G161104	VarioSmart® Fiber Unit MM 62.5/125 OM1, 4x	1.0 mm	1.0 g /m	50 mm
8G161108	VarioSmart® Fiber Unit MM 62.5/125 OM1, 8x	1.5 mm	1.8 g /m	80 mm
8G161112	VarioSmart® Fiber Unit MM 62.5/125 OM1, 12x	1.6 mm	2.2 g /m	80 mm
Multimode 50/125 OM2				
8G161202	VarioSmart® Fiber Unit MM 50/125 OM2, 2x	1.0 mm	1.0 g /m	50 mm
8G161204	VarioSmart® Fiber Unit MM 50/125 OM2, 4x	1.0 mm	1.0 g /m	50 mm
8G161208	VarioSmart® Fiber Unit MM 50/125 OM2, 8x	1.5 mm	1.8 g /m	80 mm
8G161212	VarioSmart® Fiber Unit MM 50/125 OM2, 12x	1.6 mm	2.2g /m	80 mm
Multimode 50/125 OM3				
8G161302	VarioSmart® Fiber Unit MM 50/125 OM3, 2x	1.0 mm	1.0 g /m	50 mm
8G161304	VarioSmart® Fiber Unit MM 50/125 OM3, 4x	1.0 mm	1.0 g /m	50 mm
8G161308	VarioSmart® Fiber Unit MM 50/125 OM3, 8x	1.5 mm	1.8 g /m	80 mm
8G161312	VarioSmart® Fiber Unit MM 50/125 OM3, 12x	1.6 mm	2.2 g /m	80 mm
Multimode 50/125 OM3E				
8G161402	VarioSmart® Fiber Unit MM 50/125 OM3e, 2x	1.0 mm	1.0 g /m	50 mm
8G161404	VarioSmart® Fiber Unit MM 50/125 OM3e, 4x	1.0 mm	1.0 g /m	50 mm
8G161408	VarioSmart® Fiber Unit MM 50/125 OM3e, 8x	1.5 mm	1.8 g /m	80 mm
8G161412	VarioSmart® Fiber Unit MM 50/125 OM3e, 12x	1.6 mm	2.2 g /m	80 mm
Single-mode 9/125 OS1				
8G161902	VarioSmart® Fiber Unit SM 9/125 OS1, 2x	1.0 mm	1.0 g /m	50 mm
8G161904	VarioSmart® Fiber Unit SM 9/125 OS1, 4x	1.0 mm	1.0 g /m	50 mm
8G161908	VarioSmart® Fiber Unit SM 9/125 OS1, 8x	1.5 mm	1.8 g /m	80 mm
8G161912	VarioSmart® Fiber Unit SM 9/125 OS1, 12x	1.6 mm	2.2 g /m	80 mm

Loose tube mini cable

Structure:

- Numbers of fibers: 48, 60 or 72 (single-mode only)
- HDPE outer sheath, with good sliding behaviour
- Colour: black

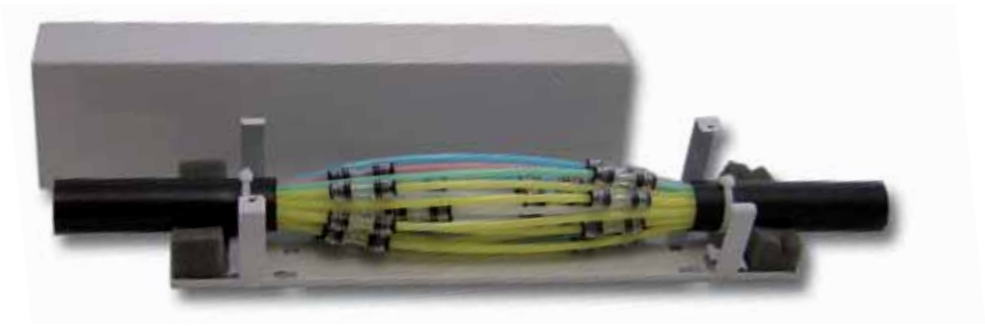
Application:

- For blowing into VarioSmart® 1000 systems

Single-mode 9/125 OS1				
Article no.	**Name of article**	**Overall diameter**	**Weight**	**Min. bending radius**
8G172948	VarioSmart® mini cable SM 9/125 OS1, 48 fibers	6.0 mm	30 kg/km	120 mm
8G172960	VarioSmart® mini cable SM 9/125 OS1, 60 fibers	6.0 mm	30 kg/km	120 mm
8G172972	VarioSmart® mini cable SM 9/125 OS1, 72 fibers	6.0 mm	30 kg/km	120 mm

Branch and terminator housings

[6d] Branch housing 02

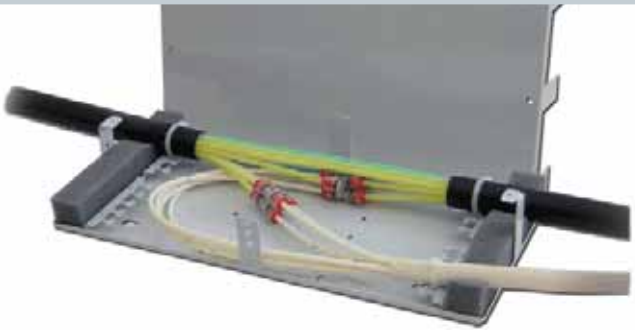


Application:

- For making branches and connections in the in-house area
- Powder-coated sheet steel RAL 7035
- Dimensions: 394 x 95 x 62 mm
- Protection class: IP45
- Temperature range: -40° to +100°C
- One input per side. Any desired number of modular cables can be used per input
  However, the sum of the diameters must be smaller than 65 mm.

Article no.	Name of article	Strain relief	Application
9A168101	VarioSmart® branch housing 02 empty	Cable clip	■ At connecting points for different cable types with no tensile load ■ At branch points of the VarioSmart® 300 and 500 cables – 7x or smaller
9A168102	VarioSmart® branch housing 02 incl. strain relief	2 strain relief clips 15-42 mm (1 per side)	■ At connecting points for different cable types with no tensile load ■ At branch points of the VarioSmart® 300 and 500 cables – 7x or smaller

[6a] Branch housing 06



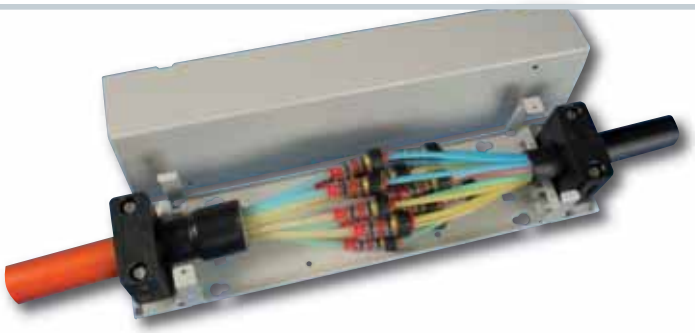
Application:

- For making branches and connections in the in-house area
- Powder-coated sheet steel RAL 7035
- Dimensions: 394 x 190 x 62 mm
- Protection class: IP45
- Temperature range: -40° to +100°C
- Two inputs per side. Any desired number of modular cables can be used per input
  However, the sum of the diameters must be smaller than 65 mm

Article no.	Name of article	Strain relief	Application
9A168103	VarioSmart® branch housing 06 empty	Cable clip	■ At connecting and branch points with no tensile load for uncut cables with branches of individual tubes
9A168104	VarioSmart® branch housing 06 incl. strain relief	4 strain relief clips 15-42 mm (2 per side)	■ At connecting and branch points with tensile load for cut cables

Terminator housing

[6b] Terminator housing 02

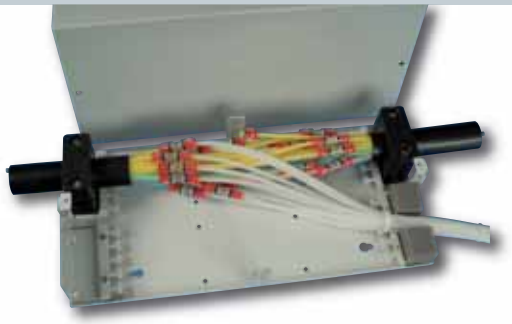


Application:

- For terminating modular cables in the in-house area
- Powder-coated sheet steel RAL 7035
- Dimensions: 394 x 95 x 62 mm
- Protection class: IP45
- Temperature range: -40° to +100°C
- One input. Any desired number of modular cables can be used per input
  However, the sum of the diameters must be smaller than 65 mm
- One strain relief clip 15-42 mm
- One screw fastening set 8 x 10 mm for connecting up to 8 flexible tubes

Article no.	Name of article	Application
9A168201	VarioSmart® branch housing 02	■ For terminating VarioSmart® 300 or 500 7x cables

Terminator housing 06

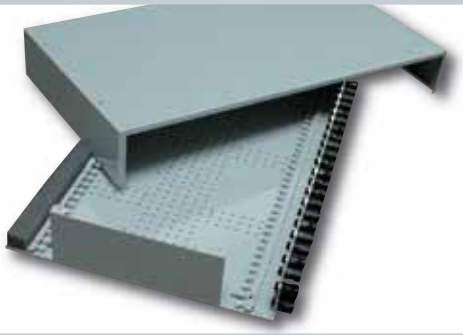


Application:

- For making terminations of modular cables in the in-house area
- Powder-coated sheet steel RAL 7035
- Dimensions: 394 x 190 x 62 mm
- Protection class: IP45
- Temperature range: -40° to +100°C
- Two inputs. Any desired number of modular cables can be used per input
  However, the sum of the diameters must be smaller than 65 mm
- Two strain relief clips 15-42mm
- Two screwing sets 8 x 10 mm for connecting up to 16 flexible tubes

Article no.	Name of article	Application
9A168202	VarioSmart® terminator housing 06	■ For terminating up to two VarioSmart® 300 or 500 cables

Terminator housing 49



Application:

- For making terminations of modular cables in the in-house area
- Powder-coated sheet steel RAL 7035
- Dimensions: 394 x 700 x 62 mm
- Protection class: IP45
- Temperature range: -40° to +100°C
- One input with 8 strain relief clips 15-42 mm
- One input with 8 screwing sets 8 x 10 mm for connecting up to 64 flexible tubes

Article no.	Name of article	Application
9A168203	VarioSmart® terminator housing 49	■ For connecting up to 8 VarioSmart® 300 or 500 cables

Accessories

(3c) Tube connector without a gas stopper

The tube connectors without gas stoppers are for connecting tubes of the same diameter.

(3d) tube connector with a gas stopper

The tube connectors with gas stoppers have a rubber seal which allows the fiber units to be sealed off from the tubes (longitudinal impermeability). They are used for preventive sealing when connecting tubes in transitional areas such as house entries.

Article no.	Name of article
9A169301	VarioSmart® 300 tube connector without a gas stopper
9A169501	VarioSmart® 500 tube connector without a gas stopper
9A169001	VarioSmart® 1000 tube connector without a gas stopper

Article no.	Name of article
9A169302	VarioSmart® 300 tube connector with a gas stopper
9A169502	VarioSmart® 500 tube connector with a gas stopper
9A169002	VarioSmart® 1000 tube connector with a gas stopper

(3b) Reduction couplings

The reduction couplings are for connecting tubes of differing diameters. They are mainly used with the VarioSmart® 500 system in terminator housings for continuing the fiber units to the splice boxes in individual 3 mm tubes.

Article no.	Name of article
9A169504	VarioSmart® 500-300 reduction coupling
9A169004	VarioSmart® 1000-500 reduction coupling

(3a) Tube closing cap

Tube closing caps are for closing unused tubes, thus preventing the intrusion of dirt or water.

Article no.	Name of article
9A169303	VarioSmart® 300 tube closing cap
9A169503	VarioSmart® 500 tube closing cap
9A169003	VarioSmart® 1000 tube closing cap

Accessories

[6] Input set

The input set is for the permanent longitudinal sealing (against gas and water) of the spaces between cut modular cables.

Article no.	Name of article
9A169102	VarioSmart® input set 25-45 mm
9A169103	VarioSmart® input set 15-38 mm
9A169104	VarioSmart® input set 8-30 mm

[5] Flexible tube

The plastic tube of high stability (crush-proof) for bundling and protecting individual loose tubes is used as a connection between terminator housings and splice boxes.

Article no.	Name of article
9A169101	VarioSmart® flexible tube 10 mm

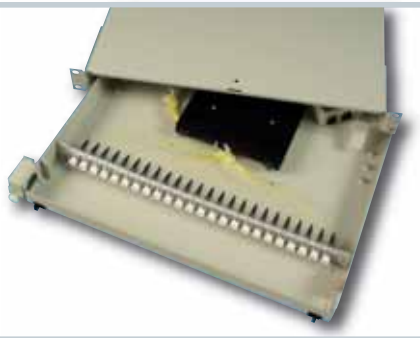
[4] Individual tube 3 mm

For continuing the fiber units of the VarioSmart® 500 system from the terminator housing to the splice box. The individual tube protects the fiber units in the flexible tube while increasing the packing density and the flexibility.

Article no.	Name of article
9A169305	VarioSmart® individual tube 3 mm

Splice/patch housing

[7] Splice/patch housing 01



Application:

- For up to 48 fibers
- Dimensions: HxWxD = 44 x 485 x 380 mm, 1 RU
- Powder-coated sheet steel RAL 7035
- One or two transverse tube entries
- Can be moved backwards and extended continuously
- Patch cord strain relief
- Patch cord bending radius check
- Patch cord guiding and plug protection via front panel

With a front panel for 16 SC-Duplex, splice cassettes for shrink splice protection and a tube entry angle for two flexible tubes

Article no.	Pre-mounted couplings	Pre-mounted pigtails
9A161001	2 x SC-Duplex	4 x SC, OM1
9A161002	4 x SC-Duplex	8 x SC, OM1
9A161003	6 x SC-Duplex	12 x SC, OM1
9A161004	12 x SC-Duplex	24 x SC, OM1
9A161005	16 x SC-Duplex	32 x SC, OM1
9A161006	2 x SC-Duplex	4 x SC, OM2
9A161007	4 x SC-Duplex	8 x SC, OM2
9A161008	6 x SC-Duplex	12 x SC, OM2
9A161009	12 x SC- Duplex	24 x SC, OM2
9A161010	16 x SC-Duplex	32 x SC, OM2
9A161011	2 x SC-Duplex	4 x SC, OS1
9A161012	4 x SC-Duplex	8 x SC, OS1
9A161013	6 x SC-Duplex	12 x SC, OS1
9A161014	12 x SC-Duplex	24 x SC, OS1
9A161015	16 x SC-Duplex	32 x SC, OS1
9A161016	2 x SC-Duplex/APC	4 x SC/APC, OS1
9A161017	4 x SC-Duplex/APC	8 x SC/APC, OS1
9A161018	6 x SC-Duplex/APC	12 x SC/APC, OS1
9A161019	12 x SC-Duplex/APC	24 x SC/APC, OS1
9A161020	16 x SC-Duplex/APC	32 x SC/APC, OS1

With a front panel for 24 ST, splice cassettes for shrink splice protection and a tube entry angle for two flexible tubes

Article no.	Pre-mounted couplings	Pre-mounted pigtails
9A161021	4 x ST	4 x ST, OM1
9A161022	8 x ST	8 x ST, OM1
9A161023	12 x ST	12 x ST, OM1
9A161024	24 x ST	24 x ST, OM1
9A161025	4 x ST	4 x ST, OM2
9A161026	8 x ST	8 x ST, OM2
9A161027	12 x ST	12 x ST, OM2
9A161028	24 x ST	24 x ST, OM2
9A161029	4 x ST	4 x ST, OS1
9A161030	8 x ST	8 x ST, OS1
9A161031	12 x ST	12 x ST, OS1
9A161032	24 x ST	24 x ST, OS1

With a front panel for 24 FC-PC, splice cassettes for shrink splice protection and a tube entry angle for two flexible tubes

Article no.	Pre-mounted couplings	Pre-mounted pigtails
9A161033	4 x FC	4 x FC, OM1
9A161034	8 x FC	8 x FC, OM1
9A161035	12 x FC	12 x FC, OM1
9A161036	24 x FC	24 x FC, OM1
9A161037	4 x FC	4 x FC, OM2
9A161038	8 x FC	8 x FC, OM2
9A161039	12 x FC	12 x FC, OM2
9A161040	24 x FC	24 x FC, OM2
9A161041	4 x FC	4 x FC, OS1
9A161042	8 x FC	8 x FC, OS1
9A161043	12 x FC	12 x FC, OS1
9A161044	24 x FC	24 x FC, OS1
9A161045	4 x FC/APC	4 x FC/APC, OS1
9A161046	8 x FC/APC	8 x FC/APC, OS1
9A161047	12 x FC/APC	12 x FC/APC, OS1
9A161048	24 x FC/APC	24 x FC/APC, OS1

With a front panel for 24 LC-Duplex, splice cassettes for shrink splice protection and a tube entry angle for two flexible tubes

Article no.	Pre-mounted couplings	Pre-mounted pigtails
9A161049	4 x LC-Duplex	8 x LC, OM2
9A161050	6 x LC-Duplex	12 x LC, OM2
9A161051	12 x LC-Duplex	24 x LC, OM2
9A161052	18 x LC-Duplex	32 x LC, OM2
9A161053	24 x LC-Duplex	48 x LC, OM2
9A161054	4 x LC-Duplex	8 x LC, OS1
9A161055	6 x LC-Duplex	12 x LC, OS1
9A161056	12 x LC-Duplex	24 x LC, OS1
9A161057	18 x LC-Duplex	32 x LC, OS1
9A161058	24 x LC-Duplex	48 x LC, OS1

With a front panel for 24 E2,000, splice cassettes for shrink splice protection and a tube entry angle for two flexible tubes

Article no.	Pre-mounted couplings	Pre-mounted pigtails
9A161059	4 x E2,000	4 x E2,000, OS1
9A161060	8 x E2,000	8 x E2,000, OS1
9A161061	12 x E2,000	12 x E2,000, OS1
9A161062	24 x E2,000	24 x E2,000, OS1
9A161063	4 x E2,000/HRL	4 x E2,000/HRL, OS1
9A161064	8 x E2,000/HRL	8 x E2,000/HRL, OS1
9A161065	12 x E2,000/HRL	12 x E2,000/HRL, OS1
9A161066	24 x E2,000/HRL	24 x E2,000/HRL, OS1

With a front panel for 16 SC-Duplex, splice cassettes for crimp splice protection and a tube entry angle for two flexible tubes

Article no.	Pre-mounted couplings	Pre-mounted pigtails
9A161067	2 x SC-Dupolex	4 x SC, OM1
9A161068	4 x SC-Duplex	8 x SC, OM1
9A161069	6 x SC-Duplex	12 x SC, OM1
9A161070	12 x SC-Duplex	24 x SC, OM1
9A161071	16 x SC-Duplex	32 x SC, OM1
9A161072	2 x SC-Dupolex	4 x SC, OM2
9A161073	4 x SC-Duplex	8 x SC, OM2
9A161074	6 x SC-Duplex	12 x SC, OM2
9A161075	12 x SC- Duplex	24 x SC, OM2
9A161076	16 x SC-Duplex	32 x SC, OM2
9A161077	2 x SC-Duplex	4 x SC, OS1
9A161078	4 x SC-Duplex	8 x SC, OS1
9A161079	6 x SC-Duplex	12 x SC, OS1
9A161080	12 x SC-Duplex	24 x SC, OS1
9A161081	16 x SC-Duplex	32 x SC, OS1
9A161082	2 x SC-Duplex/APC	4 x SC/APC, OS1
9A161083	4 x SC-Duplex/APC	8 x SC/APC, OS1
9A161084	6 x SC-Duplex/APC	12 x SC/APC, OS1
9A161085	12 x SC-Duplex/APC	24 x SC/APC, OS1
9A161086	16 x SC-Duplex/APC	32 x SC/APC, OS1

With a front panel for 24 ST, splice cassettes for crimp splice protection and a tube entry angle for two flexible tubes

Article no.	Pre-mounted couplings	Pre-mounted pigtails
9A161087	4 x ST	4 x ST, OM1
9A161088	8 x ST	8 x ST, OM1
9A161089	12 x ST	12 x ST, OM1
9A161090	24 x ST	24 x ST, OM1
9A161091	4 x ST	4 x ST, OM2
9A161092	8 x ST	8 x ST, OM2
9A161093	12 x ST	12 x ST, OM2
9A161094	24 x ST	24 x ST, OM2
9A161095	4 x ST	4 x ST, OS1
9A161096	8 x ST	8 x ST, OS1
9A161097	12 x ST	12 x ST, OS1
9A161098	24 x ST	24 x ST, OS1

With a front panel for 24 FC-PC, splice cassettes for shrink splice protection and a tube entry angle for two flexible tubes

Article no.	Pre-mounted couplings	Pre-mounted pigtails
9A161099	4 x FC	4 x FC, OM1
9A161100	8 x FC	8 x FC, OM1
9A161101	12 x FC	12 x FC, OM1
9A161102	24 x FC	24 x FC, OM1
9A161103	4 x FC	4 x FC, OM2
9A161104	8 x FC	8 x FC, OM2
9A161105	12 x FC	12 x FC, OM2
9A161106	24 x FC	24 x FC, OM2
9A161107	4 x FC	4 x FC, OS1
9A161108	8 x FC	8 x FC, OS1
9A161109	12 x FC	12 x FC, OS1
9A161110	24 x FC	24 x FC, OS1
9A161111	4 x FC/APC	4 x FC/APC, OS1
9A161112	8 x FC/APC	8 x FC/APC, OS1
9A161113	12 x FC/APC	12 x FC/APC, OS1
9A161114	24 x FC/APC	24 x FC/APC, OS1

With a front panel for 24 LC-Duplex, splice cassettes for shrink splice protection and a tube entry angle for two flexible tubes

Article no.	Pre-mounted couplings	Pre-mounted pigtails
9A161115	4 x LC-Duplex	8 x LC, OM2
9A161116	6 x LC-Duplex	12 x LC, OM2
9A161117	12 x LC-Duplex	24 x LC, OM2
9A161118	18 x LC-Duplex	32 x LC, OM2
9A161119	24 x LC-Duplex	48 x LC, OM2
9A161120	4 x LC-Duplex	8 x LC, OS1
9A161121	6 x LC-Duplex	12 x LC, OS1
9A161122	12 x LC-Duplex	24 x LC, OS1
9A161123	18 x LC-Duplex	32 x LC, OS1
9A161124	24 x LC-Duplex	48 x LC, OS1

With a front panel for 24 E2,000, splice cassettes for shrink splice protection and a tube entry angle for two flexible tubes

Article no.	Pre-mounted couplings	Pre-mounted pigtails
9A161125	4 x E2,000	4 x E2,000, OS1
9A161126	8 x E2,000	8 x E2,000, OS1
9A161127	12 x E2,000	12 x E2,000, OS1
9A161128	24 x E2,000	24 x E2,000, OS1
9A161129	4 x E2,000/HRL	4 x E2,000/HRL, OS1
9A161130	8 x E2,000/HRL	8 x E2,000/HRL, OS1
9A161131	12 x E2,000/HRL	12 x E2,000/HRL, OS1
9A161132	24 x E2,000/HRL	24 x E2,000/HRL, OS1

Acceptance tests for GigaLineNet®

The acceptance tests for GigaLineNet® cabling systems are conducted according to the requirements of ISO/IEC 11801/ EN 50173-1:2005. Further standards concerning acceptance tests are DIN EN 50346 for multimode channels and DIN EN 61280-4-2 for single-mode channels.

GigaLineNet® components and cables contain glass fibers of high quality. An FO system built up using GigaLineNet® components offers the customer reserves which exceed the requirements of the standard.

Acceptance tests are an important instrument for ensuring customer satisfaction. Only units from well-known manufacturers are able to meet these high demands.

Especially in the case of OTDR tests, it is necessary to use high-quality field measuring instruments which have sufficient dynamics and a high resolution.

Maximum attenuation of the channel in dB

Class	Multimode		Single-mode	
	850 nm	1,300 nm	1,310 nm	1,550 nm
OF 300	2.55	1.95	1.80	1.80
OF 500	3.25	2.25	2.00	2.00
OF 2,000	8.50	4.50	3.50	3.50
OF 5,000			4.00	4.00
OF 10,000			6.00	6.00

Attenuation measuring instruments

OTDR

Attenuation measuring instruments as well as OTDR are indispensable for professional FO installation.

Modular wall outlet program

VarioLine®

Adapters

Wall outlets

Frames

The VarioLine® wall outlet program from LEONI Kerpen allows copper and fiber optic systems (fiber-to-the-desk) to be terminated at the workplace. VarioLine® is stable and easy to install.
The modular copper connection systems ELine™ PREMIUM and ELine™ NOVUM, all systems with Keystone dimensions and all usual FO couplings can be integrated.

The wall outlet program is available in different colours and is compatible with usual switch programs complying with different national standards.

Wall socket inserts

VarioLine®
dual wall outlet insert
45 x 45 PREMIUM

Product description

- Wall outlet insert for installation in usual French style 45 x 45 cover frames
- Integrated hinged dust protection covers
- Delivery without cover frame
- Can be equipped with a maximum of 2 jacks
  ELine 1200® EC7
  ELine 500® RJ45 S
  ELine 250®RJ45 S
  ELine 250® RJ45 U or a combination of two systems
- Width of frame: 45 mm
- Height of frame: 45 mm
- Depth (empty): 42 mm
- Inclination: 28°
- Marking: via marking field
- Colour: pure white; RAL 9010
- Body of housing: plastic
- Slots: 2

Article no.:
9ZE80001
Pcs. per packing unit: 8

VarioLine®
dual wall outlet insert
45 x 45 NOVUM

Product description

- Wall outlet insert for installation in usual French style 45 x 45 cover frames
- Integrated hinged dust protection covers
- Delivery without cover frame
- Can be equipped with a maximum of 2 jacks
  ELine 600® GG45
  ELine 250® MLU
- Width of frame: 45 mm
- Height of frame: 45 mm
- Depth (empty): 42 mm
- Inclination: 28°
- Marking: via marking field
- Colour: pure white; RAL 9010
- Body of housing: plastic
- Slots: 2

Article no.:
9ZE80002
Pcs. per packing unit: 8

VarioLine®
dual wall outlet insert
50 x 50 PREMIUM

Product description

- Wall outlet insert for installation in usual 50 x 50 cover frames
- Integrated hinged dust protection covers
- Delivery without cover frame
- Can be equipped with a maximum of 2 jacks
  ELine 1200® EC7
  ELine 500® RJ45 S
  ELine 250®RJ45 S
  ELine 250® RJ45 U or a combination of two systems
- Width of frame: 50 mm
- Height of frame: 50 mm
- Depth (empty): 42 mm
- Inclination: 28°
- Marking: via marking field
- Colour: pure white; RAL 9010
- Body of housing: plastic
- Slots: 2
- Fastening: metal ring and screws for fastening are enclosed

Article no.:
9ZE80003
Pcs. per packing unit: 8

VarioLine®
dual wall outlet insert
50 x 50 NOVUM

Product description

- Wall outlet insert for installation in usual 50 x 50 cover frames
- Integrated hinged dust protection covers
- Delivery without cover frame
- Can be equipped with a maximum of 2 jacks
  ELine 600® GG45
  ELine 250® MLU
- Width of frame: 50 mm
- Height of frame: 50 mm
- Depth (empty): 42 mm
- Inclination: 28°
- Marking: via marking field
- Colour: pure white; RAL 9010
- Body of housing: plastic
- Scope of delivery: central plate (50 x 50), metal mounting ring, fastening screws

Article no.:
9ZE80004
Pcs. per packing unit: 8

VarioLine®
FO wall outlet insert
45 x 45

Product description

- Wall outlet insert for installation in French style 45 x 45 cover frames
- Delivery without cover frame
- Unequipped, for up to 2 FLine® ST or FC-PC couplings
- Width of frame: 45 mm
- Height of frame: 45 mm
- Depth (empty): 42 mm
- Inclination: 28°
- Marking: via marking field
- Colour: pure white; RAL 9010
- Body of housing: plastic
- Dust protection: integrated plastic flap
- Slots: 2

Article no.:
9F2Z2100
Pcs. per packing unit: 8

VarioLine®
FO wall outlet insert
45 x 45

Product description

- Wall outlet insert for installation in French style 45 x 45 cover frames
- Delivery without cover frame
- Unequipped, for one FLine® SC-Duplex or SC-Duplex/ST coupling
- Width of frame: 45 mm
- Height of frame: 45 mm
- Depth (empty): 42 mm
- Inclination: 28°
- Marking: via marking field
- Colour: pure white; RAL 9010
- Body of housing: plastic
- Dust protection: integrated plastic flap
- Slots: 2

Article no.:
9F2Z2200
Pcs. per packing unit: 8

VarioLine®
FO wall outlet insert
45 x 45

Product description

- Wall outlet insert for installation in French style 45 x 45 cover frames
- Delivery without cover frame
- Unequipped, for one FLine® SC-Simplex, LC-Duplex, E-2000 or MTRJ couplings
- Width of frame: 45 mm
- Height of frame: 45 mm
- Depth (empty): 42 mm
- Inclination: 28°
- Marking: via marking field
- Colour: pure white; RAL 9010
- Body of housing: plastic
- Dust protection: integrated plastic flap
- Slots: 2

Article no.:
9F2Z2000
Pcs. per packing unit: 8

VarioLine®
FO wall outlet insert
50 x 50

Product description

- Wall outlet insert for installation in usual 50 x 50 cover frames
- Delivery without cover frame
- Unequipped, for one FLine® SC-Duplex or SC-Duplex/ST coupling
- Width of frame: 50 mm
- Height of frame: 50 mm
- Depth (empty): 42 mm
- Inclination: 28°
- Marking: via marking field
- Colour: pure white; RAL 9010
- Body of housing: plastic
- Dust protection: integrated plastic flap
- Slots: 2

Article no.:
9F2Z1200
Pcs. per packing unit: 8

Wall socket inserts

VarioLine®
FO wall outlet insert
50 x 50

Product description

- Wall outlet insert for installation in usual cover frames
- Delivery without cover frame
- Unequipped, for up to 2 FLine® SC-Simplex, LC-Duplex, E-2000 or MTRJ couplings
- Width of frame: 50 mm
- Height of frame: 50 mm
- Depth (empty): 42 mm
- Inclination: 28°
- Marking: via marking field
- Colour: pure white; RAL 9010
- Body of housing: plastic
- Dust protection: integrated plastic flap
- Slots: 2

Article no.:
9F2Z1000
Pcs. per packing unit: 8

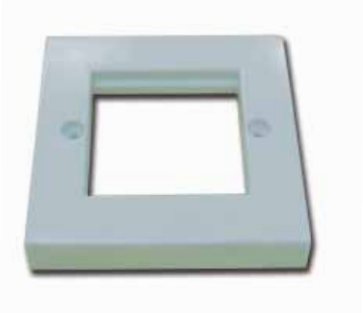
VarioLine®
FO wall outlet insert
50 x 50

Product description

- Wall outlet insert for installation in usual cover frames
- Delivery without cover frame
- Unequipped, for up to 2 FLine® ST or FC-PC couplings
- Width of frame: 50 mm
- Height of frame: 50 mm
- Depth (empty): 42 mm
- Inclination: 28°
- Marking: via marking field
- Colour: pure white; RAL 9010
- Body of housing: plastic
- Slots: 2

Article no.:
9F2Z1100
Pcs. per packing unit: 8

Cover frames



VarioLine® frames (UK style)

Product description

- Plastic cover frame 86 x 86 mm with rectangular opening 50 x 50 mm
- For integrating VarioLine® adapters 50 x 50 mm into 45 x 45 (9ZE80014)
- Colour: pure white; RAL 9010
- Dimensions: 86 x 86 mm

Article no.:
9ZE81000
Pcs. per packing unit: 8

VarioLine® frames (UK style)

Product description

- Plastic cover frame 86 x 146 mm with rectangular opening 50 x 100 mm
- For integrating VarioLine® adapters 50 x 50 mm on 45 x 45 (9ZE80014)
- Colour: pure white; RAL 9010
- Dimensions: 86 x 146 mm

Article no.:
9ZE81001
Pcs. per packing unit: 8

VarioLine® adapter 45 x 45 mm to 50 x 50 mm

Product description

- For adapting 45 x 45 mm VarioLine® wall outlets in frames (UK style) (86 x 86) Article no. 9ZE81000 and 9ZE810001
- Plastic
- Colour: pure white; RAL 9010

Article no.:
9ZE80014
Pcs. per packing unit: 8

Compatibility matrix

ELine™ – VarioLine®				
Class	**ELine™ system**	**MegaLine® cabel**	**VarioLine® wall outlets**	**National standard**
F_A/F	PREMIUM			
	ELine 1200® EC7	G12-150 S/F	8ZE80001	French
			8ZE80003	German / English
	NOVUM			
	ELine 600® GG45	SY22	8ZE80002	French
		SY23	8ZE80004	German / English
E_A	PREMIUM			
	ELine 500® RJ45	E5-70 S/F	8ZE80001	French
		E5-70 F/F		
		E5-60 U/F	8ZE80003	German / English
E	PREMIUM			
shielded	ELine 250® RJ45S	E2-45 F/F	8ZE80001	French
		E2-45 U/F		
		E2-30 F/U	8ZE80003	German / English
E	NOVUM			
unshielded	ELine 250® MLU	E2-30 U/U	8ZE80002	French
			8ZE80004	German / English

Wall outlets		National standard
80 x 80	9ZE80005	German
86 x 86	9ZE80006	English
80 x 80	9ZE80013	French

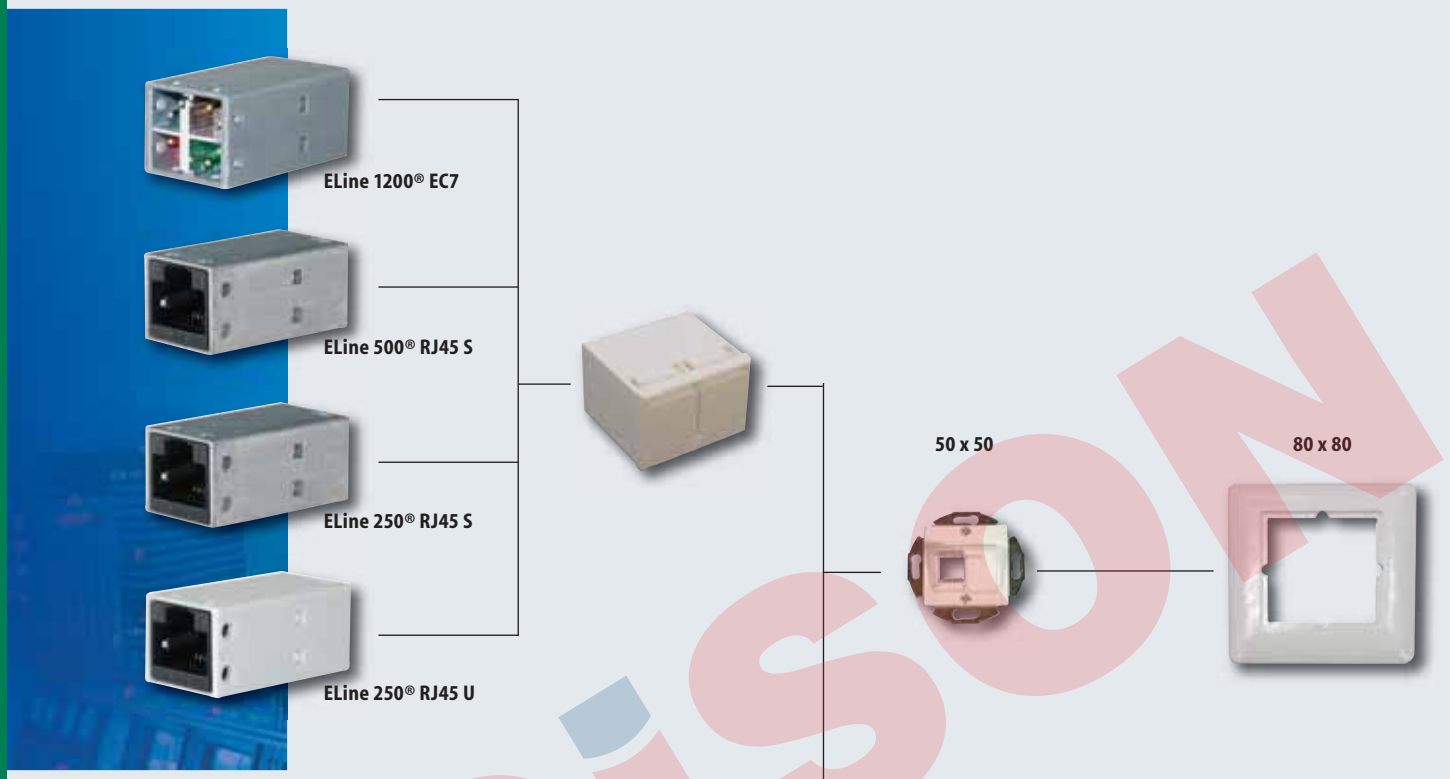
Compatibility matrix

FLine® – VarioLine®						
Fiber category	**Maximum 10 GbE link length in m**	**VarioLine® 50 x 50 German / English**		**VarioLine® 45 x 45 French**		**FLine® plug type**
		VarioLine® wall outlets	FLine® adapters	VarioLine® wall outlets	FLine® adapters	
OM1 G62,5	65	9F2Z1100	9FZ90023	9F2Z2100	9FZ90023	ST
		9F2Z1200	9FZ90004	9F2Z2200	9FZ90004	SC-DX
		9F2Z1000	9FZM0055	9F2Z2000	9FZM0055	LC-DX
		9F2Z1100	9FZM0040	9F2Z2100	9FZM0040	FC-PC
		9F2Z1000	9FZM0037	9F2Z2000	9FZM0037	MT-RJ
OM2 G50/125	110	9F2Z1100	9FZ90023	9F2Z2100	9FZ90023	ST
		9F2Z1200	9FZ90004	9F2Z2200	9FZ90004	SC-DX
		9F2Z1000	9FZM0055	9F2Z2000	9FZM0055	LC-DX
		9F2Z1100	9FZM0040	9F2Z2100	9FZM0040	FC-PC
		9F2Z1000	9FZM0037	9F2Z2000	9FZM0037	MT-RJ
		9F2Z1000	9FZM0032	9F2Z2000	9FZM0032	E2000
OM3 G50/125	300	9F2Z1100	9FZ90023	9F2Z2100	9FZ90023	ST
		9F2Z1200	9FZ90004	9F2Z2200	9FZ90004	SC-DX
		9F2Z1000	9FZM0055	9F2Z2000	9FZM0055	LC-DX
		9F2Z1100	9FZM0040	9F2Z2100	9FZM0040	FC-PC
		9F2Z1000	9FZM0037	9F2Z2000	9FZM0037	MT-RJ
		9F2Z1000	9FZM0032	9F2Z2000	9FZM0032	E2000
OM3e G50/125	550	9F2Z1100	9FZ90023	9F2Z2100	9FZ90023	ST
		9F2Z1200	9FZ90004	9F2Z2200	9FZ90004	SC-DX
		9F2Z1000	9FZM0055	9F2Z2000	9FZM0055	LC-DX
		9F2Z1000	9FZM0032	9F2Z2000	9FZM0032	E2000
OS1 E9/125	10000	9F2Z1200	9FZ90003	9F2Z2200	9FZ90003	SC-DX
		9F2Z1200	9FZ90015	9F2Z2200	9FZ90015	SC-APC
		9F2Z1000	9FZM0055	9F2Z2000	9FZM0055	LC-DX
		9F2Z1000	9FZM0055	9F2Z2000	9FZM0055	LC-APC
		9F2Z1000	9FZM0032	9F2Z2000	9FZM0032	E2000

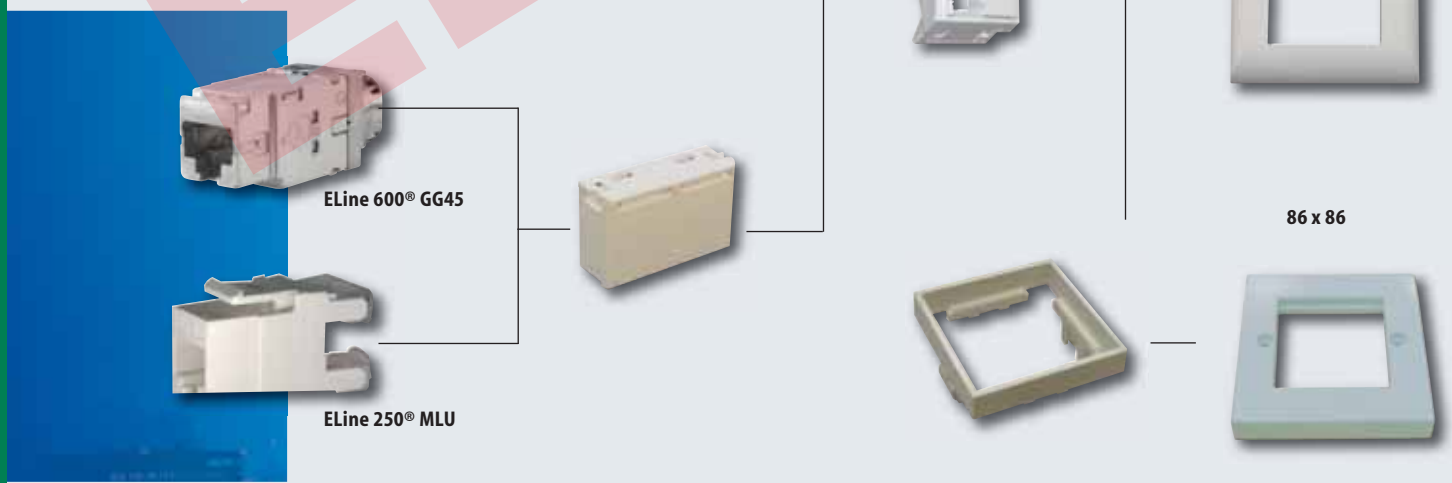
Wall outlets		National standard
80 x 80	9ZE80005	German
86 x 86	9ZE80006	English
80 x 80	9ZE80013	French

Jack Adapter Wall outlet Frame

ELine™ PREMIUM



ELine™ NOVUM



One cable, one outlet, one system

Kerpen HomeNet®

Terrestrial network ISDN/DSL

Cable network DVB-C

Antenna DVB-T

Satellite DVB-S

Cellular radio GSM/UMTS

If you build a house nowadays, you should do it with foresight. This is especially true for in-house technology.

Television, telephone, computer, video and audio – Kerpen HomeNet® brings all this and much more into your entire home via a simple, extremely flexible cabling with future capabilities.

Kerpen HomeNet® –

living more comfortably, flexibly and healthily

If you build a house nowadays, you should do it with foresight. This is especially true for in-house technology. Television, telephone, computer, video and audio – Kerpen HomeNet® brings all this and much more into your entire home via a simple, extremely flexible cabling with future capabilities.

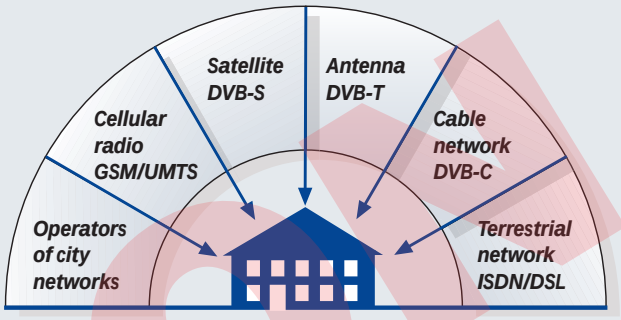
Kerpen HomeNet®
Networking on demand

A house lives and changes according to the different phases of life of its inhabitants. One connection in the living room might be enough today, but tomorrow three or four will be necessary. What's a nursery today could be used as an office tomorrow. Flexible utilization of the living space is what is needed here – especially in residential buildings with mixed uses such as an office, a lawyer's office or a doctor's surgery. Residential buildings are often used over many generations. Young families build the house for themselves and the children they expect.

From entertainment electronics to the Internet and from television to telephony, everything is used in virtually every room. However, needs and habits change with the times. One day signalling and auxiliary equipment will become more important than the colourful world of the media. This is when Kerpen HomeNet® shows its very real benefits: from alarm buttons to sensor carpets, cabling is used in a completely new way. Kerpen HomeNet® makes everything possible. Kerpen HomeNet® is the cabling system which keeps you open for the future.

Kerpen HomeNet®
Ingeniously simple and as convenient as can be

Kerpen HomeNet® centrally bundles what enters a building via many different channels - telephone, image and data services - and distributes it in the house via one cable – to every room, or better still to every wall!



It is thus possible to connect to the telephone, the Internet, a PC, a TV, a radio or many other things via any desired outlet. This is because every device uses the same wall plug. The connection of the devices is provided for by suitably matched 4-, 2- or 1-pair EC7 work area cords.

Kerpen HomeNet®

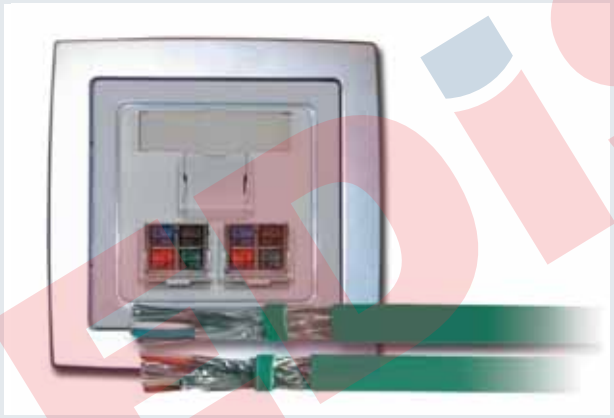
The basis …

Kerpen HomeNet® multimedia cable MMC
The basis for multimedia and more ...

Kerpen HomeNet® MMC 150 and Kerpen HomeNet® MMC 230 with their exceptional attenuation and shielding characteristics are especially suitable for use at high and very high frequencies. The shielding of the Kerpen HomeNet® MMC cable types gives the inhabitants of the building permanent protection against EMC effects of high-frequency transmissions. In this way, it was possible to reduce the unhealthy effects of communication technology to a considerable extent.

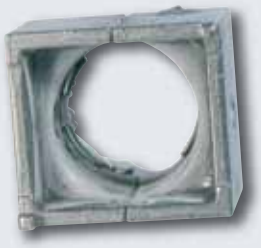
Technical data: MMJ 3000:

- Better than Category 7/Class F according to ISO/IEC 11801 and EN 50173, 2nd Edition
- Designed according to IEC 61076-3-105, 2.3 GHz
- MMJ 3000 multimedia jack
- New design:
  full metal body
  3-part jack set
- Shielded
- Connection technology: push-in, gas-tight
- Shielding: 360°
- Shield attenuation: > 90 dB
- Recommended conductors: AWG 23/ ..22 and AWG 20
- Colour coding



Kerpen HomeNet®
MMJ 3000 up to 2.4 GHz via twisted pairs

With the MMJ 3000 multimedia plug, LEONI Kerpen takes the successful EC7 connector technology into a completely new dimension. Thanks to excellent shielding characteristics, this module can be used in conjunction with the new multimedia cable types in networks for all TV applications – from CATV and DVB-T to satellite frequencies.



Kerpen HomeNet®

Kerpen HomeNet®
TV via twisted pairs!

The task of transmitting analog and digital TV services via twisted pairs is technically very demanding. In order to be able to transmit all channels, transmission frequencies of up to 862 MHz are necessary for cable TV networks (CATV) and 2.1 GHz for satellite systems – this demands the utmost in reserve performance of the system and especially good attenuation characteristics. Even during development, Kerpen HomeNet® with the cable types MMC 150 and MMC 230 as well as the connector MMJ 3000 was specially optimized for this purpose, the current product range providing a wide range of tools for transmitting CATV signals.

The world of twisted pairs (100 Ohm) is connected to the world of television (75 Ohm) via twisted passive work area cords with an integrated balun. In contrast to conventional solutions, outlets can be used flexibly: Thus, from being a telephone or data outlet, MMJ 3000 is easy to turn into a TV connection later if necessary.

Kerpen HomeNet®
One cable, one outlet, one system

Until today, each data service (telephone, radio, television and PC) was assigned to a different outlet.

Kerpen HomeNet® is an outlet for all applications.

www.kerpen-homenet.com

Kerpen HomeNet®

Kerpen HomeNet®

Your connection to the data highway.

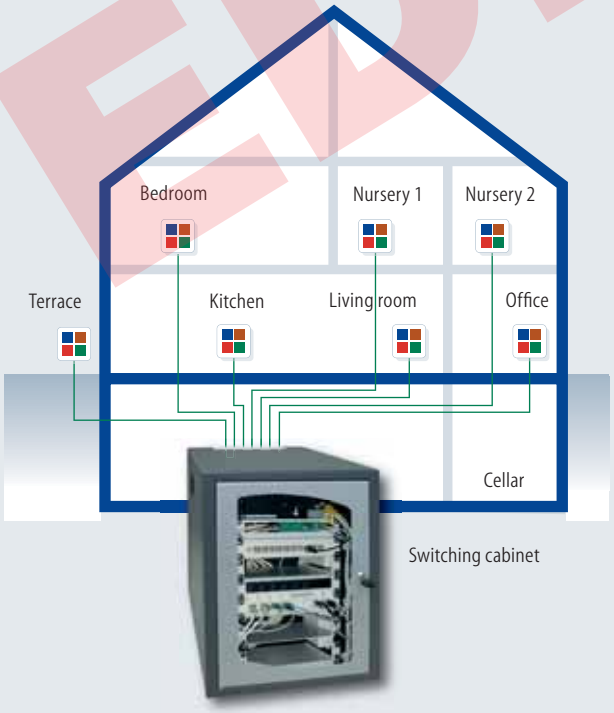
All modern supply networks – whether they are ISDN, DSL, cable TV networks or even glass fibers leading into your house – can be supported and propagated via the internal cabling. All services are centrally organized, checked and routed to the individual rooms in a simple, convenient way via the cables from the central switching cabinet in the cellar, in the room for service or house connections or in the electricity sub-distribution room. Of course, the star-shaped cabling allows Kerpen HomeNet® to be extended at any time by adding further connections.

Kerpen HomeNet®

Individually into every room ...

At the heart of the cabling system is the central switching cabinet from which all services can be centrally distributed in the building. This is where all of the active components of HomeNet such as modems, switches for your network or all amplifiers, splitters etc. belonging to the antenna technology are to be found. Home cabling via Kerpen HomeNet® is clearly structured, straightforward and easy to operate.

Flexibility and convenience rise with the number of connections in a building.



Kerpen HomeNet®

Flexible with every connection ...

More and more people will be working from home in future. Kerpen HomeNet® makes it easy to set up a teleworkplace. For example, it is no problem at all to connect telephone, PC and fax machine to one outlet.

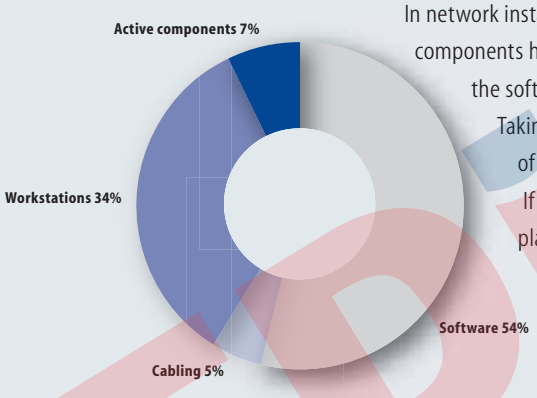
No matter whether it's games, music, video, telephone, radio or television you want to connect - Kerpen HomeNet® puts the connections are right where you need them. For example, you can connect a PC, a television set and a HiFi system to one wall outlet only – and network them with other devices in other rooms.

Here‘s the information you‘ll find under:

www.leoni-datacom.com

- Specifications and tender texts
- Technical articles
- Certification programme “KERPEN Trained Networker”
- Seminars and roadshows
- Up-to-date information

If you save on the cabling …



In network installation, the passive cabling only accounts for about 5 % of the costs, whereas the active components have a share of 7 %. About one third of the costs (34 %) are invested in the workstation and the software swallows up the lion‘s share with 54 %.

Taking into account that the passive cabling has a product lifetime of 15 years, it‘s clear for all to see:

If you save on the cabling, you‘re saving in the wrong place!

Notes

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EDISON

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