Introduction

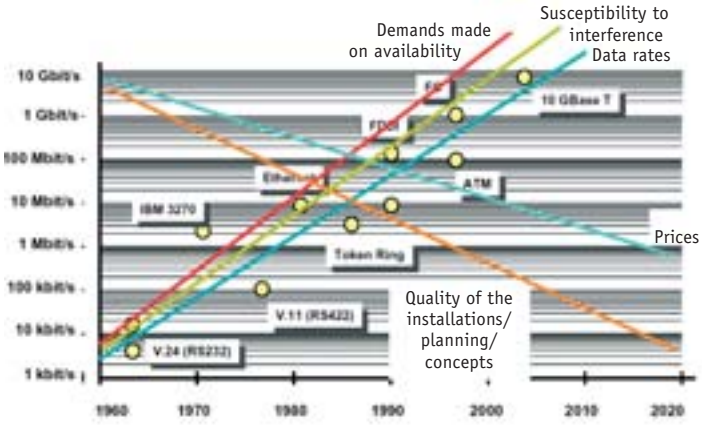
In addition to numerous discoveries and achievement, the last thousend years have brought us the still young age of information.
Now we are experiencing a veritable information explosion.
Whereas humanity required about 40,000 years to double its knowledge, Robert Anton Wilson tells us that this is now happening every two years.

Since the invention of the **Internet**, this knowledge has been available everywhere around the clock. **Worldwide networking** makes this possible.

Knowledge transfer thus no longer takes place in the form of analog voice transmission via the 100-year-old telephone network but preferably as digital data, image or voice transmission.
The information quantity is not measured in printed A4 pages now but in bits and bytes.

Did you know that a file size of up to 8 Mbytes is required for a PowerPoint presentation?
And that 24 digital photographs occupy memory space of 48 Mbytes?

In the course of 20 years, the transmission performance of networks designed to meet the demands of the future has increased by the incredible factor of 10,000 – and there is no end in sight.



Incredible but true: an uncompressed HDTV film with a length of two hours swallows up 1.35 Tbytes!

The demands made on network processors and the system periphery are rising considerably in step with the rapid increase in file size.

The prospective development of high-performance network technologies takes this fact into consideration.

As far back as 1990, the network industry allowed the transmission of 10 Mbit/s up to the user, thus replacing the techniques used in the first phase.
Five years later, performance at the workplace had been multiplied by 10 to reach 100 Mbit/s.
Since the year 2000, 1 Gigabit Ethernet has been on the increase.

A new era will be rung in with the introduction of 10 Gigabit Ethernet in 2006.

However, rising data rates, increased demands made on availability and growing susceptibility to interference on the one hand against price drops and the associated reduction in the quality of the planning and implementation of network installations on the other are now the cause of increasingly frequent network failure or reduced network performance.

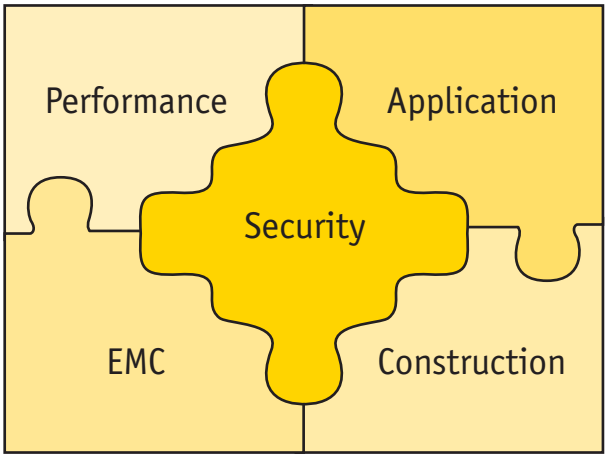
According to a survey carried out by well-known experts, 33 % of faults are due to unsuitable installations and 24 % are a result of insufficient planning. In 18 % of cases, faulty or insufficiently dimensioned cabling components were the cause of network problems.

If you consider that, measured against an expected service life of 10 to 15 years for the cabling required for information technology, the costs only make up 5 % of the total network costs, minimum budgets for the cabling often turn out to be bad investments. Sometimes the follow-up costs are several times the amount spent on the initial installation.

The SPACE concept

With its new SPACE concept, KERPEN offers the market and its customers a decision-making matrix for finding the correct data cable in a pragmatic, 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.

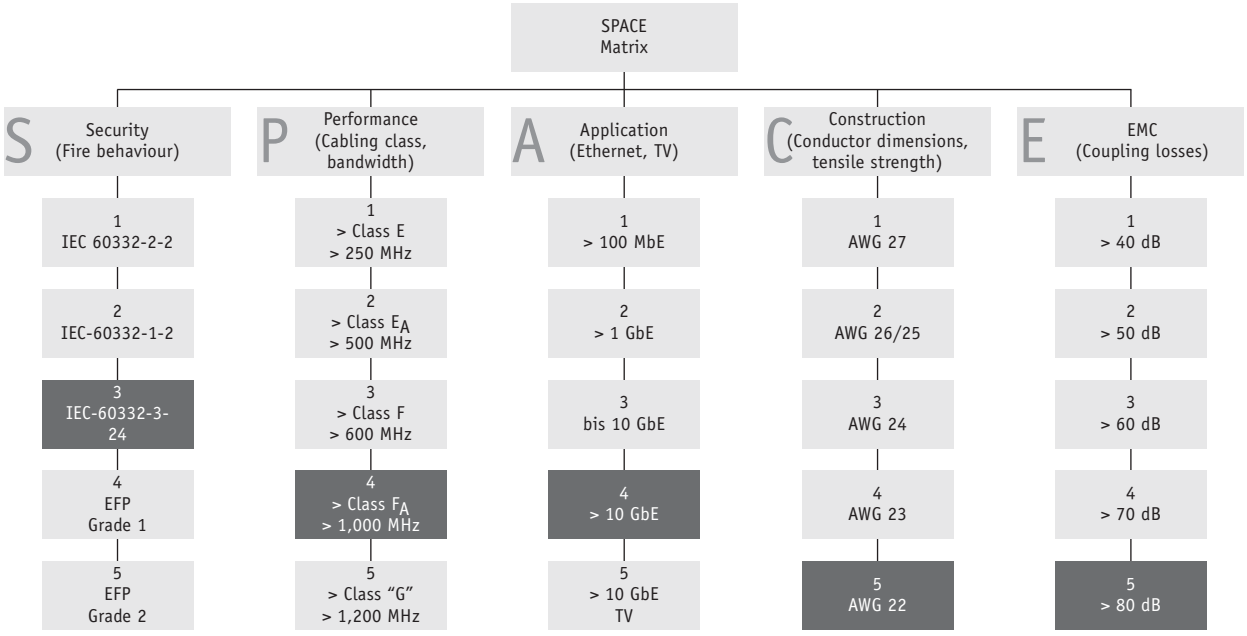


The SPACE concept also allows the value for money to be assessed and creates “space” for alternative technical and economical scenarios.

The demands made on the segment in question rise in step with the increase in the SPACE index.
For example, the cable marked in yellow 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 noise suppression totals > 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), KERPEN documents that it guarantees the SPACE quality features at all times.



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. The aim is to prevent or minimise the spreading of fire and the consequential damage it causes. This is achieved via flame-resistant, 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 (OI up to 45) reduces the flammability

The KERPEN 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.

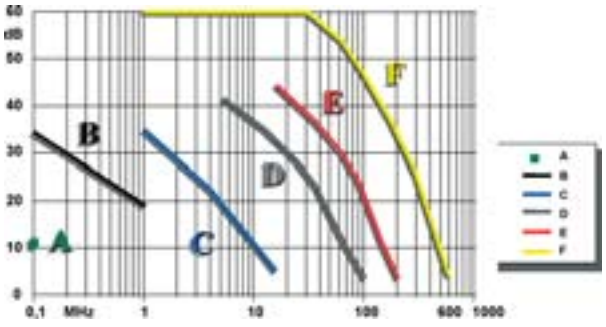
Safety levels S_3 to S_5 are used in particular where high and very high safety measures are required for the protection of persons (in hospitals, schools, hotels, airports, stations, department stores etc.) or material assets (in power stations, computer centres, banks and insurance companies, alarm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

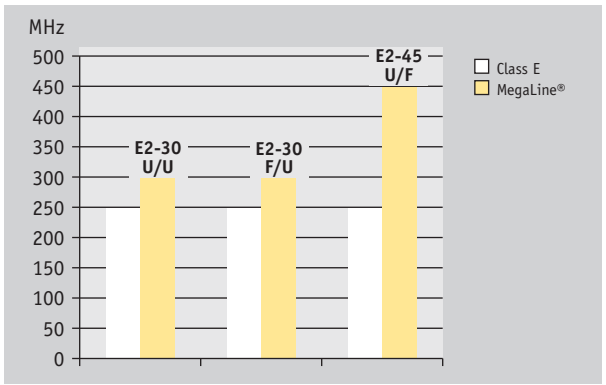
The international standards have often not gone far enough due to the compromises struggled for and in view of the swiftly increasing transmission rates. Since the development of 10 Gigabit Ethernet, none of the cabling classes below Class F can be said to meet the demands of the future.



Hard work is currently being done to standardise new classes in order to meet to the demands of the future.

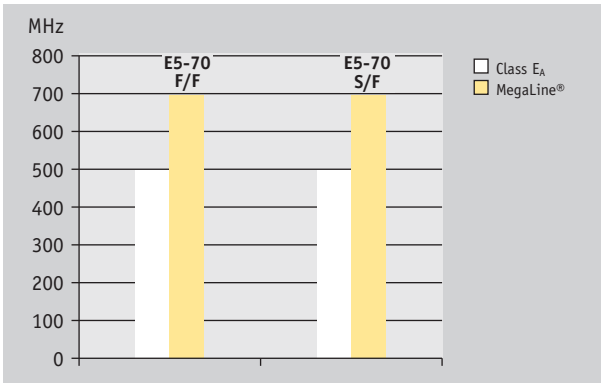
With the MegaLine® SPACE concept, KERPEN provides five different performance classes to choose from. Each of them in itself has very high reserves with regard to the standard involved.

P_1: better than Class F (250 MHz)



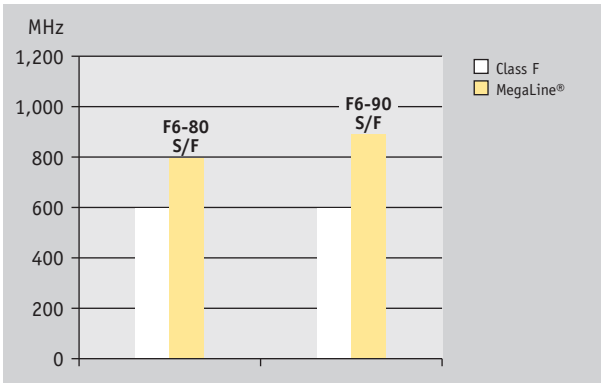
For example MegaLine® E2-45 U/F: better than Category 6 according to EN 50288 and IEC 61156 very good NEXT, low SKEW

P_2: better than Class E_A (500 MHz)



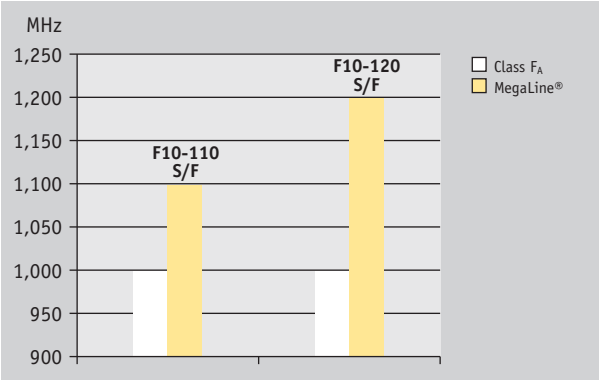
For example MegaLine® E5-70 S/F: better than Category 6 according to EN 50288 and IEC 61156 very good NEXT, very good shield characteristics (shielding of pairs and overall shielding), low SKEW

P_3: better than Class F (600 MHz)



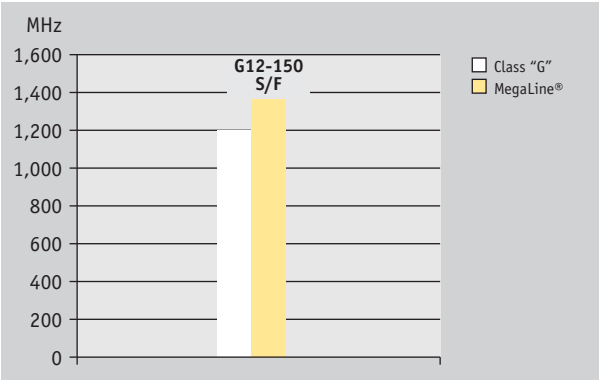
For example MegaLine® F6-90 S/F: better than Category 7 according to EN 50288 and IEC 61156 excellent NEXT, excellent shield characteristics (shielding of pairs and overall shielding), low SKEW

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



For example MegaLine® F10-120 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.

Their excellent performance, their "total" universal capabilities and their convincing economic efficiency make them an unbeatable transmission medium for 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.

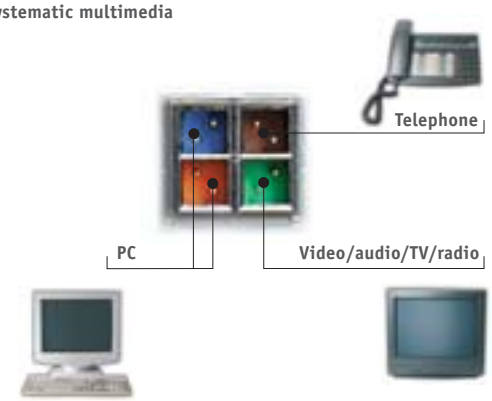
The large safety reserves mean that multimedia applications like TV or transmission protocols with high bandwidth requirements such as 10 Gigabit Ethernet and 8 Gigabit Fiberchannel can be transmitted over 100 m.

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.

Systematic multimedia



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.

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

A_1: up to 100 Mbit/s (Fast Ethernet)
IEEE 802.3 u
A_2: up to 1,000 Mbit/s (Gigabit Ethernet)
IEEE 802.3 ab
A_3: up to 10,000 Mbit/s (10 Gigabit Ethernet)
IEEE 802.3 an (draft)
A_4: over 10,000 Mbit/s (10 Gigabit Ethernet)
IEEE 802.3 an (draft)
A_5: over 10,000 Mbit/s (10 Gigabit Ethernet) and TV
IEEE 802.3 an (draft) 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.

KERPEN first put MegaLine® data cables in 4-pair S/FTP design (100 Ohm) on the market in the early 90s. This 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, 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 savings and the robust cable structure are beneficial in assembly and installation, even under difficult conditions.

With the MegaLine® SPACE concept, KERPEN divides the MegaLine® range into five different conductor 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 KERPEN 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, 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:

xx/xxx

- 3rd x: Balanced element ___TP
- 2nd x: Individual shield___U = Unshielded; F = Foil shield
- 1st x: Overall shield___F = Foil shield; S = Copper braid shield; SF = Cooper 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 120 = 1,200 MHz 110 = 1,100 MHz 90 = 900 MHz 8 = 800 MHz 70 = 700 MHz 45 = 450 MHz 30 = 300 MHz 20 = 200 MHz

SF/UTP

F/UTP

U/UTP

With the SPACE concept, 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® F10-120 S/F H: data cable according to new cabling class F_A (1,000 MHz) with a bandwidth of 1,200 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

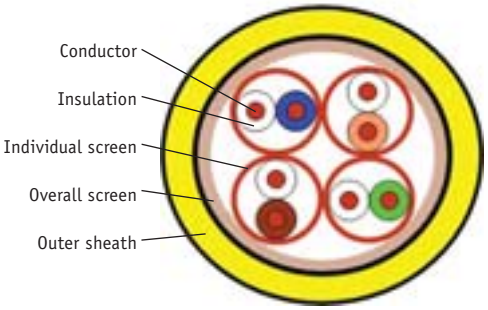
Sheath

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

MegaLine® G12-150 S/F
$S_3P_5A_5C_5E_5$

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

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



Printing outer sheath:
KERPEN 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

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.)

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 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

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) and for residential cabling and SOHO acc. ISO/IEC 15018 and EN 50173-3 (draft). Ideal for all applications of classes D up to F_A Multimedia (TV, Video, Data, Voice) >10 GbE acc. IEEE 802.3 an (draft), Cable sharing, VoIP, PoE

A	1 > 100 MbE	2 > 1 GbE	3 up to 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: 130 (max.)
Crush (N/100mm): 1,000
Impact (number of shocks): 10

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

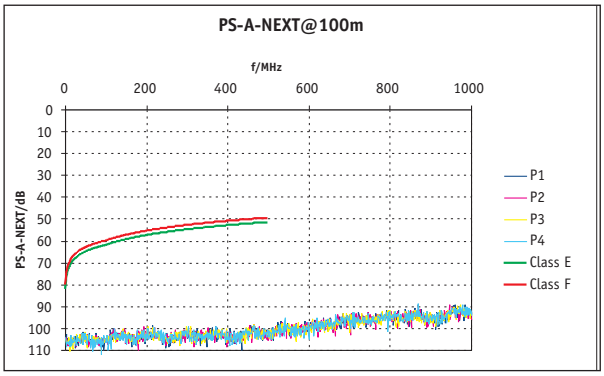
Construction (Conductor size, Tensile strength)

Electromagnetic behaviour:
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)

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): 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): 0.8 (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/IEC 61156-5

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

Certificates and Approvals:
Quality mark with production control: ◁VDE▷
Link performance: KERPEN ELine™ 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

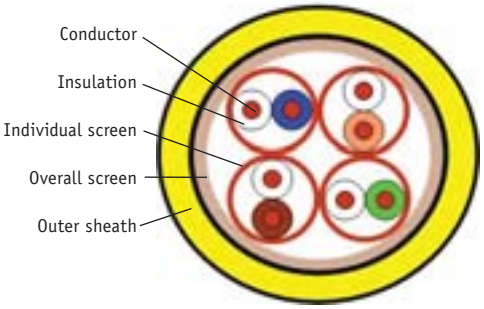
Article number	Size	Overall diameter mm	Weight kg/km	Copper number kg/km	Colour sheat
7KS80001	4P	8.6 (approx.)	80 (approx.)	48	yellow, RAL 1021

Package: Drum 1,000 m

MegaLine® F10-120 S/F
$S_3P_4A_4C_5E_5$

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

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



Printing outer sheath:
KERPEN MegaLine® F10-120 S/F 4P H SPACE CODE 34455
"VDE approval markk" "Production lot code"
"Meter marking"

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

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 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 7 acc. EN 50288 and IEC 61156 excellent NEXT, low attenuation, excellent screening characteristics (individual and overall screen), low SKEW
Bandwidth 1,200 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). Ideal for all applications of classes D up to F_A Multimedia (Video, Data, Voice) >10 GbE acc. IEEE 802.3 an (draft), Cable sharing, VoIP, PoE

A	1 > 100 MbE	2 > 1 GbE	3 up to 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: 130 (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**

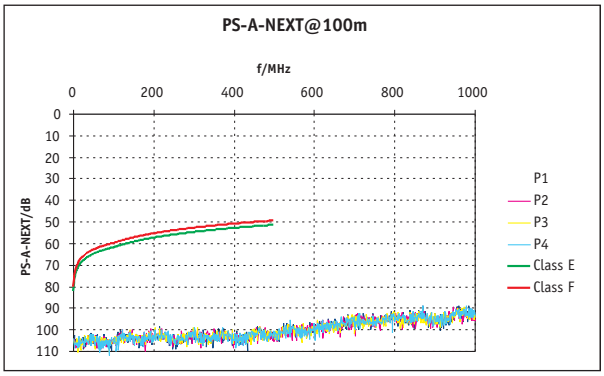
Construction (Conductor size, Tensile strength)

Electromagnetic behaviour:
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 > 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): 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): 0.8 (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	–	88	–	85	–	36	–	33	–	53	–	50	–	23.6	–
1,000	54.8	–	85	–	82	–	30	–	27	–	48	–	45	–	22.3	–
1,100	56.9	–	83	–	80	–	26	–	23	–	44	–	41	–	21.4	–
1,200	59	–	78	–	75	–	19	–	16	–	40	–	37	–	20.5	–

* EN 50288-4-1/IEC 61156-5

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

Certificates and Approvals:
Quality mark with production control: ◁VDE▷
Link performance: KERPEN ELine™ 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

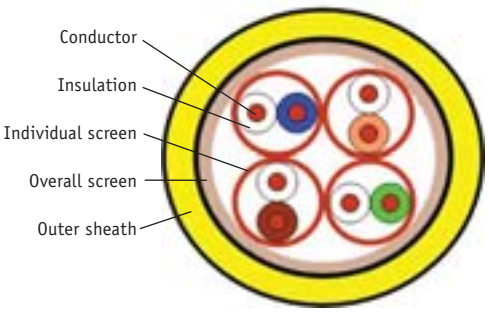
Article number	Size	Overall diameter mm	Weight kg/km	Copper number kg/km	Colour sheat
7KS70001	4P	8.6 (approx.)	80 (approx.)	48	yellow, RAL 1021
7KS70002	2x4P	8.6 x 17.5 (approx.)	162 (approx.)	96	yellow, RAL 1021

Package: Drum 1,000 m

MegaLine® F10-110 S/F
$S_3P_4A_4C_4E_5$

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

Construction:
Conductor: bare copper wire, AWG 23/1
Insulation: cellular-PE, core-Ø: max. 1.40 mm
Twisting element: Pair
Twisting: 4 pairs
Overall screen: tinned copper wire braid
Outer sheath: halogen-free, flame retardend compound



Printing outer sheath:
KERPEN MegaLine® F10-110 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

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): 0.60/1.2 (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 1,100 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 F_A Multimedia (Video, Data, Voice) >10 GbE acc. IEEE 802.3 an (draft), Cable sharing, VoIP, PoE

A	1	2	3	4	5
	> 100 MbE	> 1 GbE	up to 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: 110/220 (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

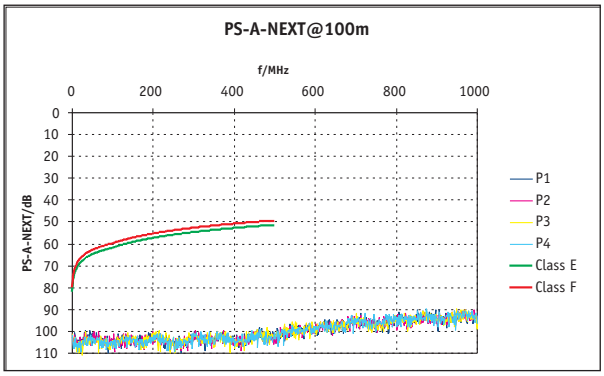
Construction (Conductor size, Tensile strength)

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): 0.8 (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	–	88	–	85	–	33	–	30	–	49	–	46	–	22.6	–
1,000	58	–	85	–	82	–	27	–	24	–	44	–	41	–	21.5	–
1,100	60.6	–	83	–	80	–	22	–	19	–	39	–	36	–	20.6	–

* EN 50288-4-1/IEC 61156-5

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

Certificates and Approvals:
Quality mark with production control: ◁VDE▷
Link performance: KERPEN ELine™ 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

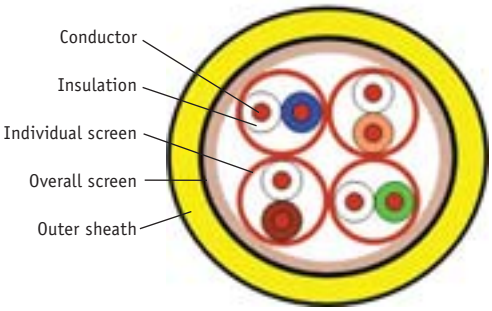
Article number	Size	Overall diameter mm	Weight kg/km	Copper number kg/km	Colour sheat
7KS70008	4P	7.5 (approx.)	67 (approx.)	37	yellow, RAL 1021
7KS70009	2x4P	7.5 x 15.2 (approx.)	136 (approx.)	74	yellow, RAL 1021

Package: Drum 1,000 m

MegaLine® F6-90 S/F
$S_3P_3A_4C_4E_5$

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

Construction:
Conductor: bare copper wire, AWG 23/1
Insulation: cellular-PE, core-Ø: max. 1.40 mm
Twisting element: Pair
Individual screen: aluminium bonded polyester tape
Twisting: 4 pairs
Overall screen: tinned copper wire braid
Outer sheath: halogen-free, flame retardend compound



Printing outer sheath:
KERPEN 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

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): 0.6/1.2 (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 900 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 F Multimedia (Video, Data, Voice) >10 GbE acc. IEEE 802.3 an (draft), Cable sharing, VoIP, PoE

A	1	2	3	4	5
	> 100 MbE	> 1 GbE	up to 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: 110/220 (max.)
Crush (N/100mm): 1,000
Impact (number of shocks): 10

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

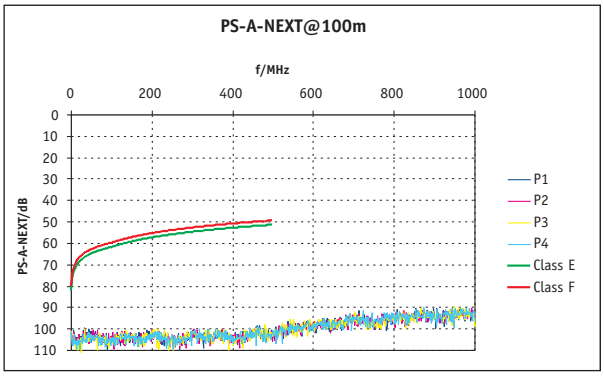
Construction (Conductor size, Tensile strength)

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): 0.8 (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/IEC 61156-5

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

Certificates and Approvals:
Quality mark with production control: ◁VDE▷
Link performance: KERPEN ELine™ 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

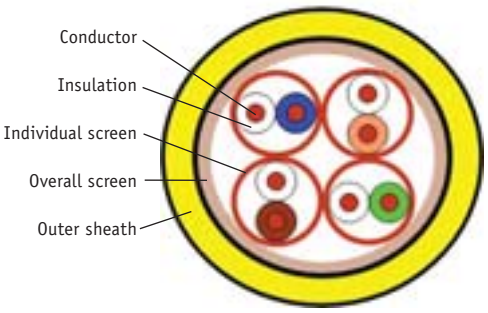
Article number	Size	Overall diameter mm	Weight kg/km	Copper number kg/km	Colour sheat
7KS70010	4P	7.5 (approx.)	67 (approx.)	37	yellow, RAL 1021
7KS70011	2x4P	7.5 x 15.2 (approx.)	136 (approx.)	74	yellow, RAL 1021

Package: Drum 1,000 m

MegaLine® F6-80 S/F
$S_2P_3A_4C_4E_4$

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

Construction:
Conductor: bare copper wire, AWG 23/1
Insulation: cellular-PE, core-Ø: max. 1.40 mm
Twisting element: Pair
Individual screen: aluminium bonded polyester tape
Twisting: 4 pairs
Overall screen: tinned copper wire braid
Outer sheath: halogen-free, flame retardend compound



Printing outer sheath:
KERPEN MegaLine® F6-80 S/F 4P H SPACE CODE 23444
"Number of registration" "Production lot code"
"Meter marking"

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

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): 0.6/1.2 (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. IEC 61156 excellent NEXT, excellent screening characteristics (individual and overall screen), low SKEW
Bandwidth 800 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 F Multimedia (Video, Data, Voice) >10 GbE acc. IEEE 802.3 an (draft), Cable sharing, VoIP, PoE

A	1	2	3	4	5
	> 100 MbE	> 1 GbE	up to 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: 110/220 (max.)
Crush (N/100mm): 1,000
Impact (number of shocks): 10

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

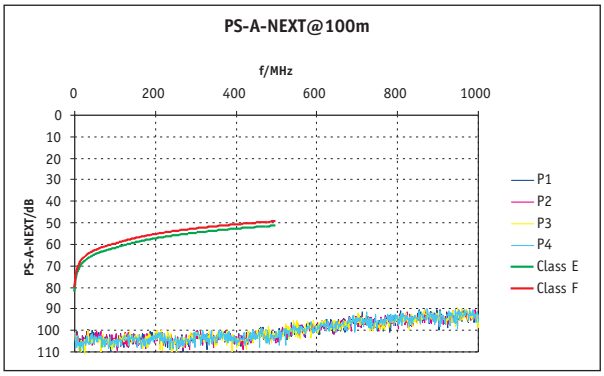
Construction (Conductor size, Tensile strength)

Electromagnetic behaviour:
Transfer impedance at 10 MHz (mOhm/m):
10 (nominal value)
Screening attenuation up to 1,000 MHz (dB):
55 (nominal value)
Coupling attenuation up to 1,000 MHz (dB):
80 (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): 0.8 (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	19.0	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	31.0	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 50288-10-1 (draft)/EN 50288-5-1/IEC 61156-5

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

Certificates and Approvals:
Quality mark with production control: ◁VDE▷
Number of registration VDE
Link performance: KERPEN ELine™ 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

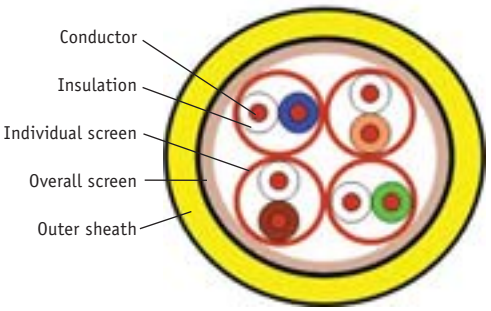
Article number	Size	Overall diameter mm	Weight kg/km	Copper number kg/km	Colour sheat
7KS70012	4P	7.4 (approx.)	58 (approx.)	34	yellow, RAL 1021
7KS70013	2x4P	7.4 x 15.0 (approx.)	120 (approx.)	68	yellow, RAL 1021

Package: Drum 1,000 m

MegaLine® E5-70 S/F
$S_3P_2A_3C_4E_4$

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

Construction:
Conductor: bare copper wire, AWG 23/1
Insulation: cellular-PE, core-Ø: max. 1.40 mm
Twisting element: Pair
Individual screen: aluminium bonded polyester tape
Twisting: 4 pairs
Overall screen: tinned copper wire braid
Outer sheath: halogen-free, flame retardend compound



Printing outer sheath:
KERPEN MegaLine® E5-70 S/F 4P H SPACE CODE 32344
“VDE approval mark” “Production lot code”
“Meter marking”

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

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): 0.6/1.2 (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, very 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 (draft), Cable sharing, VoIP, PoE

A	1	2	3	4	5
	> 100 MbE	> 1 GbE	**up to 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: 110/220 (max.)
Crush (N/100mm): 1,000
Impact (number of shocks): 10

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

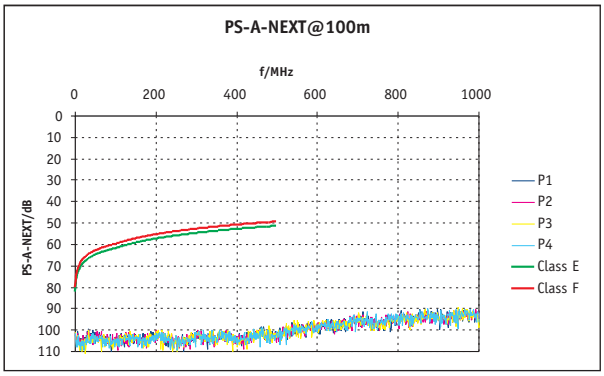
Construction (Conductor size, Tensile strength)

Electromagnetic behaviour:
Transfer impedance at 10 MHz (mOhm/m):
5 (nominal value)
Screening attenuation up to 1,000 MHz (dB):
60 (nominal value)
Coupling attenuation up to 1,000 MHz (dB):
80 (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): 0.8 (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	26	-
10	5.2	5.9	90	59	87	57	85	53	82	51	96	57	93	54	35.9	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	33.1	18
250	29.9	31	66	38	63	36	36	7	33	5	75	36	72	33	30.5	17.3
300	31.9	34.2	65	37	62	35	33	3	30	1	72	35	69	32	29.9	17.3
450	38.9	42.7	63	35	60	33	24	–8	21	–10	69	33	66	30	28.9	17.3
500	41.2	45.3	61	34	58	32	20	–11	17	–13	66	32	63	29	28.3	17.3
600	46.2	–	57	–	54	–	11	–	8	–	60	–	57	–	27.2	–
700	51.4	–	54	–	51	–	3	–	0	–	56	–	53	–	26.2	–

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

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

Certificates and Approvals:
Quality mark with production control: ◁VDE▷
Link performance: KERPEN ELine™ 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

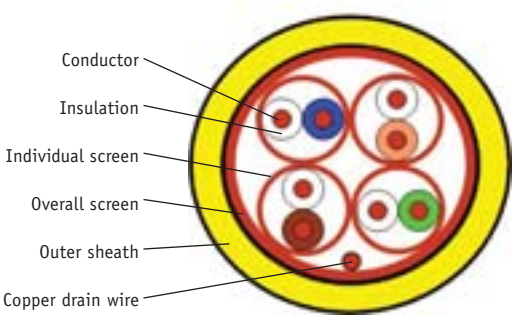
Article number	Size	Overall diameter mm	Weight kg/km	Copper number kg/km	Colour sheat
7KS60024	4P	7.6 (approx.)	67 (approx.)	34	yellow, RAL 1021
7KS60025	2x4P	7.5 x 15.2 (approx.)	136 (approx.)	68	yellow, RAL 1021

Package: Drum 1,000 m

MegaLine® E5-70 F/F
$S_3P_2A_3C_4E_3$

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

Construction:
Conductor: bare copper wire, AWG 23/1
Insulation: cellular-PE, core-Ø: max. 1.40 mm
Twisting element: Pair
Individual screen: aluminium bonded polyester tape
Twisting: 4 pairs
Overall screen: aluminium bonded polyester tape, metal side inside, with underlayed tinned copper drain wire AWG 24/1
Outer sheath: halogen-free, flame retardend compound



Printing outer sheath:
KERPEN MegaLine® E5-70 F/F 4P H SPACE CODE 2343
"VDE approval mark" "Production lot code"
"Meter marking"

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

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): 0.6/1.2 (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 (draft), Cable sharing, VoIP, PoE

A	1	2	3	4	5
	> 100 MbE	> 1 GbE	**up to 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: 110/220 (max.)
Crush (N/100mm): 1,000
Impact (number of shocks): 10

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

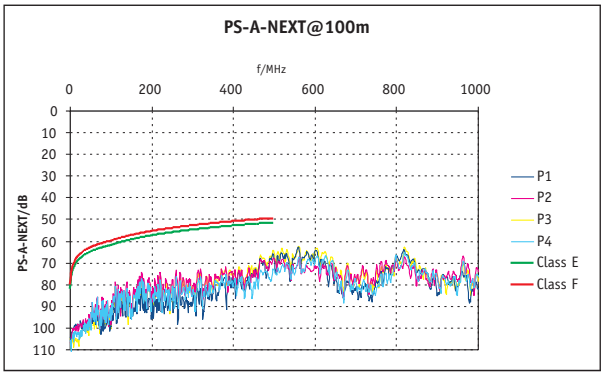
Construction (Conductor size, Tensile strength)

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): 0.8 (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/IEC 61156-5

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

Certificates and Approvals:
Quality mark with production control: ◁VDE▷
Link performance: KERPEN ELine™ 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

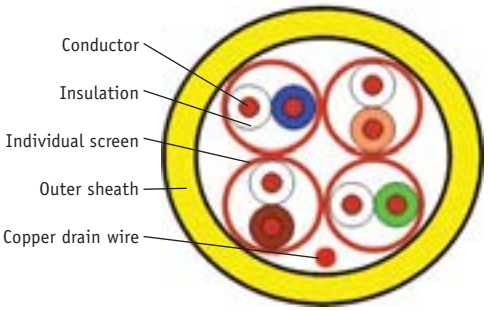
Article number	Size	Overall diameter mm	Weight kg/km	Copper number kg/km	Colour sheat
7KS60022	4P	7.5 (approx.)	58 (approx.)	23.5	yellow, RAL 1021
7KS60023	2x4P	7.5 x 15.4 (approx.)	120 (approx.)	47	yellow, RAL 1021

Package: Drum 1,000 m

MegaLine® E2-45 U/F
$S_2P_1A_2C_4E_2$

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

Construction:
Conductor: bare copper wire, AWG 23/1
Insulation: cellular-PE, core-Ø: max. 1.40 mm
Twisting element: Pair
Individual screen: aluminium bonded polyester tape
Twisting: 4 pairs
Tape: plastic foil (optional) with underlayed tinned copper drain wire AWG 24/1
Outer sheath: halogen-free, flame retardend compound



Printing outer sheath:
KERPEN 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

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): 0.6/1.2 (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
very good NEXT, low SKEW
Bandwidth 450 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).
Ideal for all applications of classes D up to E up to 1 GbE acc. IEEE 802.3 an (draft), Cable sharing, VoIP, PoE

A	1 > 100 MbE	**2 > 1 GbE**	3 up to 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: 110/220 (max.)
Crush (N/100mm): 1,000
Impact (number of shocks): 10

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

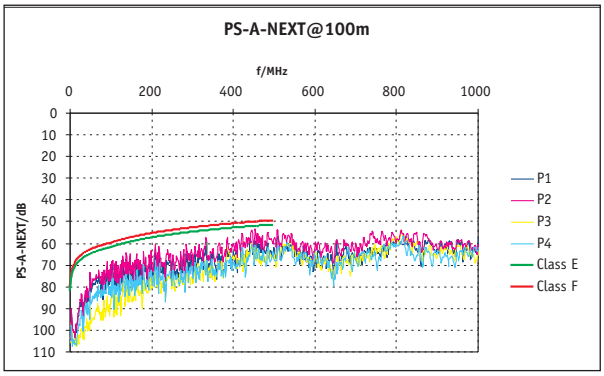
Construction (Conductor size, Tensile strength)

Electromagnetic behaviour:
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 > 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): 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): 0.8 (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/IEC 61156-5

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

Certificates and Approvals:
Quality mark with production control: ◁VDE▷
Number of registration VDE
Link performance: KERPEN ELine™ 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

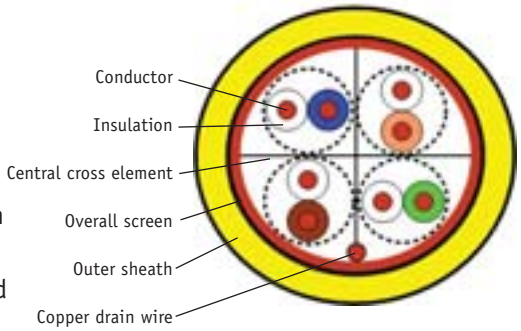
Article number	Size	Overall diameter mm	Weight kg/km	Copper number kg/km	Colour sheat
7KS60005	4P	7.4 (approx.)	55 (approx.)	23.5	yellow, RAL 1021
7KS60006	2x4P	7.5 x 15.4 (approx.)	124 (approx.)	47	yellow, RAL 1021

Package: Drum 1,000 m

MegaLine® E2-30 F/U
$S_2P_1A_2C_4E_2$

Type: KS-2Y(ST)H 4x2xAWG 23/1

Construction:
Conductor: bare copper wire, AWG 23/1
Insulation: PE
Twisting element: Pair
Twisting: 4 pairs
Overall screen: aluminium bonded polyester tape, metal side inside, with underlayed tinned copper drain wire AWG 24/1
Outer sheath: halogen-free, flame retardend compound



Printing outer sheath:
KERPEN 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

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.)

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).
Ideal 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 up to 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/100mm): 1,000
Impact (number of shocks): 10

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

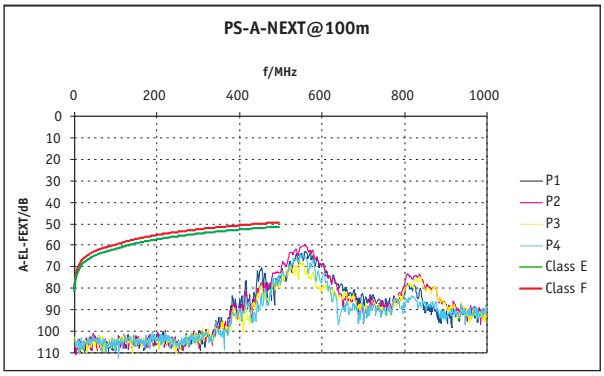
Construction (Conductor size, Tensile strength)

Electromagnetic behaviour:
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)

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): 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 50288-5-1/IEC 61156-5

Certificates and Approvals:
Link performance: KERPEN ELine™ 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 number kg/km	Colour sheat
7KS60004	4P	7.2 (approx.)	55 (approx.)	21	yellow, RAL 1021

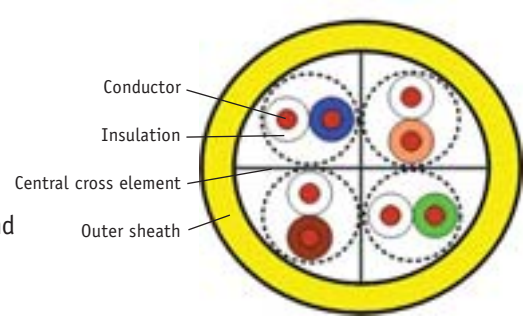
Package: Drum 1,000 m

All the necessary PLANNING DOCUMENTS are available in the Internet: **www.kerpen.com**

MegaLine® E2-30 U/U
$S_2P_1A_2C_4E_1$

Type: KS-2YH 4x2xAWG 23/1

Construction:
Conductor: bare copper wire, AWG 23/1
Insulation: PE
Twisting element: Pair
Twisting: 4 pairs
Tape: plastic foil (optional)
Outer sheath: halogen-free, flame retardend compound



Printing outer sheath:
KERPEN 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

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 up to 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(N): 110 (max.)
Crush (N/100mm): 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/IEC 61156-5

Certificates and Approvals:
Link performance: KERPEN ELine™ 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

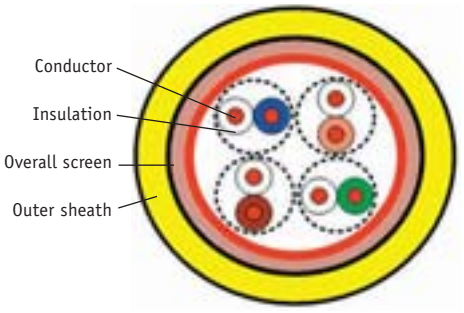
Article number	Size	Overall diameter mm	Weight kg/km	Copper number kg/km	Colour sheat
7KS60002	4P	6.4 (approx.)	45 (approx.)	22	yellow, RAL 1021

Package: Drum 1,000 m, 500 m, box 300 m

MegaLine® D1-20 SF/U
$S_2P_0A_1C_3E_3$

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

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



Printing outer sheath:
KERPEN 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

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): 0.35/0.7 (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 5 acc. EN 50288 and IEC 61156 very good screening characteristics
Bandwidth 200 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).
Ideal for all applications of class D up to 1 GbE acc. IEEE 802.3 ab, VoIP, PoE

A	**1 > 100 MbE**	2 > 1 GbE	3 up to 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: 85/170 (max.)
Crush (N/100mm): 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:
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)

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): 95 (max.)
Insulation resistance (Gohm x km): 500 (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/IEC 61156-5

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

Certificates and Approvals:
Link performance: KERPEN ELine™ 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

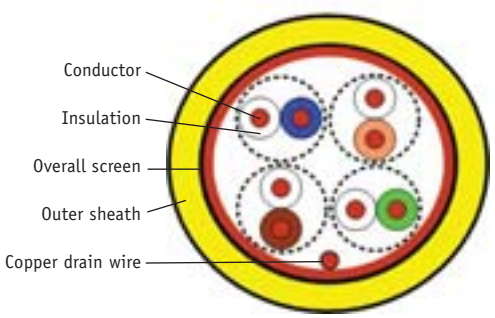
Article number	Size	Overall diameter mm	Weight kg/km	Copper number kg/km	Colour sheat
7KS50005	4P	6.0 (approx.)	42 (approx.)	26	yellow, RAL 1021
7KS50006	2x4P	6.0 x 12.5 (approx.)	86 (approx.)	52	yellow, RAL 1021

Package: Drum 1,000 m

MegaLine® D1-20 F/U
$S_2P_0A_1C_3E_2$

Type: KS-2Y(ST)H 4x2xAWG 24/1

Construction:
Conductor: bare copper wire, AWG 24/1
Insulation: PE
Twisting element: Pair
Twisting: 4 pairs
Overall screen: aluminium bonded polyester tape, metal side inside, with underlayed tinned copper drain wire AWG 24/1
Outer sheath: halogen-free, flame retardend compound



Printing outer sheath:
KERPEN MegaLine® D1-20 F/U 4P H SPACE CODE 20132
"Production lot code" "Meter marking"

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

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): 0.5 (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
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	up to 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/100mm): 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):
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)

	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): 93.2 (max.)
Insulation resistance (Gohm x km): 500 (min.)
Mutual capacitance (pF/m): 50 (approx.)
Transfer capacitance (e) (pF/km): 1,500 (approx.)
Signal velocity (c): 0.66 (approx.)
Propagation delay (ns/100m): 517 (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/IEC 61156-5

Certificates and Approvals:
Link performance: KERPEN ELine™ 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

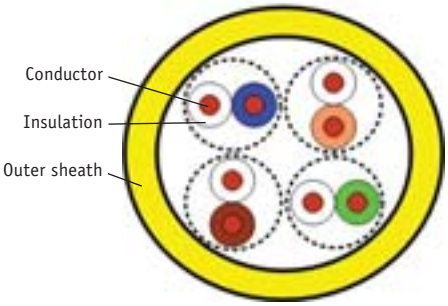
Thermal characteristics:
Temperature range for fixed installation:
-20°C up to + 60°C
Temperature range for mobile operation:
0°C up to + 50°C

Article number	Size	Overall diameter mm	Weight kg/km	Copper number kg/km	Colour sheat
7KS50004	4P	6.4 (approx.)	47 (approx.)	18	yellow, RAL 1021

Package: Drum 1,000 m

MegaLine® D1-20 U/U
$S_2P_0A_1C_3E_1$

Type: KS-2YH 4x2xAWG 24/1



Construction:
Conductor: bare copper wire, AWG 24/1
Insulation: PE
Twisting element: Pair
Twisting: 4 pairs
Outer sheath: halogen-free, flame retardend compound

Printing outer sheath:
KERPEN MegaLine® D1-20 U/U 4P H SPACE CODE 20131
"Production lot code" "Meter marking"

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

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): 0.30 (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
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).
Suitable 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	up to 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/100mm): 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:
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): 93.2 (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): 0.68 (approx.)
Propagation delay (ns/100m): 417 (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.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	77	65	74	62	75	63	72	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	6.9	8	58	47	55	44	51	39	48	36	70	40	67	37	34.3	25
31.25	9.6	11.4	53	43	50	40	44	31	41	28	63	34	60	31	33.9	23.6
62.5	13.1	16.5	49	38	46	35	36	22	33	19	58	28	55	25	31.3	21.5
100	17.5	21.3	45	35	42	32	28	14	25	11	52	24	49	21	27.7	20.1
155	22.1	–	42	–	39	–	20	–	17	–	49	–	46	–	24.7	–
200	26.2	–	40	–	37	–	14	–	11	–	45	–	42	–	22.4	–

* EN 50288-3-1/IEC 61156-5

Certificates and Approvals:
Link performance: KERPEN ELine™ systems and further commercial cabling systems
Inspection certificate: nach 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 number kg/km	Colour sheat
7KS50002	4P	5.5 (approx.)	30 (approx.)	17.3	yellow, RAL 1021

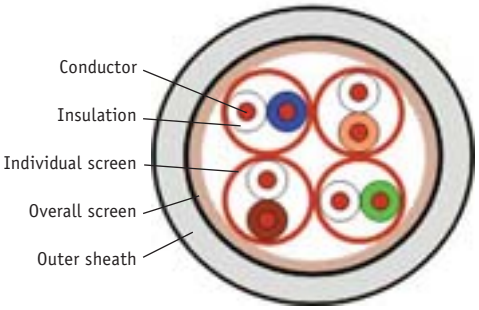
Package: Drum 1,000 m/500 m, box 300 m

All the necessary PLANNING DOCUMENTS are available in the Internet: **www.kerpen.com**

MegaLine® F10-120 S/F flex
$S_2P_4A_5C_2E_5$

Type: KS-02YSCH 4x2xAWG 26/7 PIMF
Type: KS-02YSCH 4x2xAWG 26/7 PIMF

Construction:
Conductor: bare stranded copper wire, AWG 26/7
Insulation: cellular-PE, core-Ø: max. 1.0 mm
Twisting element: Pair
Individual screen: aluminium bonded polyester tape
Twisting: 4 pairs
Overall screen: tinned copper wire braid
Outer sheath: halogen-free, flame retardend compound



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

Colour code: wh/bu, wh/or, wh/gn, wh/bn
Colour outer sheath: grey, RAL 7035;
yellow, RAL 1021; green, RAL 6018;
blue, RAL 5015; red, RAL 3000

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.)

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, low attenuation, excellent screening characteristics (individual and overall screen), low SKEW, Bandwidth 1,200 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:
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 50173-3 (draft). Ideal for all applications of classes D up to F_A Multimedia (TV, Video, Data, Voice) >10 GbE acc. IEEE 802.3 an (draft), Cable sharing, VoIP, PoE

A	1	2	3	4	5
	> 100 MbE	> 1 GbE	up to 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.)

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):
60 (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): 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 50288-6-2/IEC 61156-6

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

Certificates and Approvals:
Quality mark with production control: ◁VDE▷
Link performance: KERPEN ELine™ 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

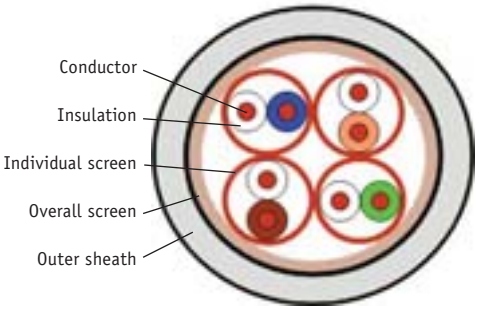
Article number	Size	Overall diameter mm	Weight kg/km	Copper number kg/km	Colour sheat
7KS70003	4P	6.0 (approx.)	42 (approx.)	23.5	grey, RAL 7035
7KS70004	4P	6.0 (approx.)	42 (approx.)	23.5	yellow, RAL 1021
7KS70005	4P	6.0 (approx.)	42 (approx.)	23.5	green, RAL 6018
7KS70006	4P	6.0 (approx.)	42 (approx.)	23.5	blue, RAL 5015
7KS70007	4P	6.0 (approx.)	42 (approx.)	23.5	red, RAL 3000

Package: Drum 1,000 m

MegaLine® F6-90 S/F flex
$S_2P_3A_4C_1E_5$

Type: KS-02YSCH 4x2xAWG 27/7 PIMF

Construction:
Conductor: bare stranded copper wire, AWG 27/7
Insulation: cellular-PE, core-Ø: max. 1.0 mm
Twisting element: Pair
Individual screen: aluminium bonded polyester tape
Twisting: 4 pairs
Overall screen: tinned copper wire braid
Outer sheath: halogen-free, flame retardend compound



Printing outer sheath:
KERPEN 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;
yellow, RAL 1021; green, RAL 6018;
blue, RAL 5015; red, RAL 3000

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.)

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 7 acc. EN 50288 and IEC 61156 excellent NEXT, excellent screening characteristics (individual and overall screen), low SKEW
Bandwidth 900 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:
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 (draft), Cable sharing, VoIP, PoE

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

Application (Ethernet, TV)

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

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

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): 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/IEC 61156-6

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: KERPEN ELine™ 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 number kg/km	Colour sheat
7KS70014	4P	5.7 (approx.)	34 (approx.)	17	grey RAL 7035
7KS70015	4P	5.7 (approx.)	34 (approx.)	17	yellow, RAL 1021
7KS70016	4P	5.7 (approx.)	34 (approx.)	17	green, RAL 6018
7KS70017	4P	5.7 (approx.)	34 (approx.)	17	blue, RAL 5015
7KS70018	4P	5.7 (approx.)	34 (approx.)	17	red, RAL 3000

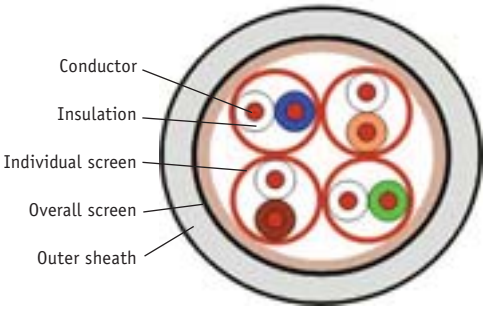
Package: Drum 1,000 m

All the necessary PLANNING DOCUMENTS are available in the Internet: **www.kerpen.com**

MegaLine® E5-70 S/F flex
$S_2P_2A_3C_1E_4$

Type: KS-02YSCH 4x2xAWG 27/7 PIMF

Construction:
Conductor: bare stranded copper wire, AWG 27/7
Insulation: cellular-PE, core-Ø: max. 1.0 mm
Twisting element: Pair
Individual screen: aluminium bonded polyester tape
Twisting: 4 pairs
Overall screen: tinned copper wire braid
Outer sheath: halogen-free, flame retardend compound



Printing outer sheath:
KERPEN 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;
yellow, RAL 1021; green, RAL 6018;
blue, RAL 5015; red, RAL 3000

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.)

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, very 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:
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 (draft), Cable sharing, VoIP, PoE

A	1	2	3	4	5
	> 100 MbE	> 1 GbE	**up to 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.)

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):
60 (nominal value)
Coupling attenuation up to 1,000 MHz (dB):
80 (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): 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	0.3	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/IEC 61156-6

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: KERPEN ELine™ 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

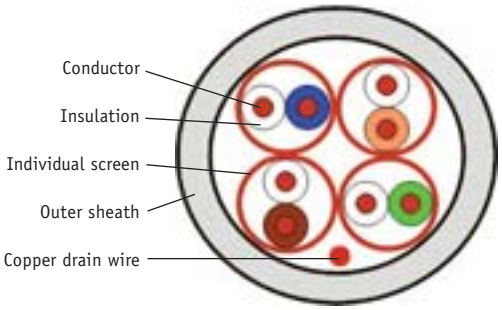
Article number	Size	Overall diameter mm	Weight kg/km	Copper number kg/km	Colour sheat
7KS60009	4P	5.7 (approx.)	34 (approx.)	17	grey, RAL 7035
7KS60010	4P	5.7 (approx.)	34 (approx.)	17	yellow, RAL 1021
7KS60011	4P	5.7 (approx.)	34 (approx.)	17	green, RAL 6018
7KS60012	4P	5.7 (approx.)	34 (approx.)	17	blue, RAL 5015
7KS60013	4P	5.7 (approx.)	34 (approx.)	17	red, RAL 3000

Package: Drum 1,000 m

MegaLine® E2-45 U/F flex
$S_2P_1A_2C_1E_2$

Type: KS-02YSH 4x2xAWG 27/7 PIMF

Construction:
Conductor: bare stranded copper wire, AWG 27/7
Insulation: cellular-PE, core-Ø: max. 1.0 mm
Twisting element: Pair
Individual screen: aluminium bonded polyester tape
Twisting: 4 pairs
Outer sheath: halogen-free, flame retardend compound



Printing outer sheath:
KERPEN MegaLine® E2-45 U/F flex 4P H
SPACE CODE 21212
“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

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): 0.32 (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, low SKEW
Bandwidth 450 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 Multimedia (Video, Data, Voice) up to 1 GbE acc. IEEE 802.3 ab, Cable sharing, VoIP, PoE

	1	2	3	4	5
A	> 100 MbE	**> 1 GbE**	up to 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):
50 (nominal value)
Coupling attenuation up to 1,000 MHz (dB):
60 (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	0.31	88	66	85	64	88	66	85	64	96	66	93	64	25	–
4	0.44	0.57	88	65	85	63	88	65	85	63	96	58	93	55	25	23
10	0.73	0.9	88	59	85	57	87	58	84	57	98	50	95	47	29.9	25
16	0.98	1.14	88	56	85	54	87	55	84	54	100	46	97	43	32.5	25
31.25	1.49	1.61	88	52	85	50	87	50	84	50	91	40	88	37	35.4	23.6
62.5	2.03	2.32	88	47	85	45	86	45	83	45	82	34	79	31	37.5	21.5
100	2.73	2.99	88	44	85	42	85	41	82	42	71	30	68	27	36.5	20.1
155	3.26	3.79	85	41	82	39	82	38	79	39	60	26	57	23	33.8	18.8
200	3.88	4.37	83	40	80	38	79	35	76	38	52	24	49	21	31	18
250	4.39	4.95	81	38	78	36	77	33	74	36	47	22	44	19	30.5	17.3
300	4.96	–	78	–	75	–	73	–	70	–	43	–	40	–	29.1	–
450	6.01	–	73	–	70	–	67	–	64	–	43	–	40	–	27	–

* EN 50288-5-2/IEC 61156-6

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: KERPEN ELine™ 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

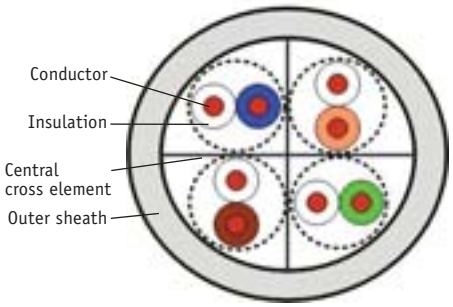
Article number	Size	Overall diameter mm	Weight kg/km	Copper number kg/km	Colour sheat
7KS60008	4P	5.3 (approx.)	25 (approx.)	15.5	grey, RAL 7035

Package: Drum 1,000 m

MegaLine® E2-30 U/U flex
$S_2P_1A_2C_3E_1$

Type: KS-02YSH 4x2xAWG 24/7

Construction:
Conductor: bare stranded copper wire, AWG 24/7
Insulation: cellular-PE
Twisting element: Pair
Twisting: 4 pairs
Outer sheath: halogen-free, flame retardend compound



Printing outer sheath:
KERPEN 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

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 (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:
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

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

Application (Ethernet, TV)

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

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): 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	0.9	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/IEC 61156-6

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

Certificates and Approvals:
Quality mark with production control: ◁VDE▷
Link performance: KERPEN ELine™ 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

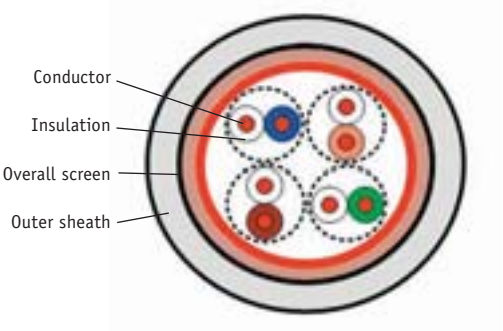
Article number	Size	Overall diameter mm	Weight kg/km	Copper number kg/km	Colour sheat
7KS60007	4P	6.2 (approx.)	45 (approx.)	19.5	grey, RAL 7035

Package: Drum 1,000 m

MegaLine® D1-20 SF/U flex
$S_2P_0A_1C_2E_3$

Type: KS-02YS(ST+C)H 4x2xAWG 26/7

Construction:
Conductor: bare stranded copper wire, AWG 26/7
Insulation: cellular-PE, core-Ø: max. 1.0 mm
Twisting element: Pair
Twisting: 4 pairs
Overall screen: aluminum-bonded polyester tape and tinned copper wire braid
Outer sheath: halogen-free, flame retardend compound



Printing outer sheath:
KERPEN MegaLine® D1-20 SF/U flex 4P H
SPACE CODE 20123
“Production lot code” “Meter marking”

Colour code: whbu/bu, whor/or, whgn/gn, whbn/bn;
Colour outer sheath: grey, RAL 7035;
yellow, RAL 1021; green, RAL 6018;
blue, RAL 5015; red, RAL 3000

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): 0.30 (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 5 acc. EN 50288 and IEC 61156 very good screening characteristics
Bandwidth 200 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:
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

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

Application (Ethernet, TV)

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

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

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): 145 (max.)
Insulation resistance (Gohm x km): 500 (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	0.6	71	56	68	53	70	56	67	53	76	52	73	49	29.8	23
10	0.8	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/IEC 61156-6

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

Certificates and Approvals:
Link performance: KERPEN ELine™ 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

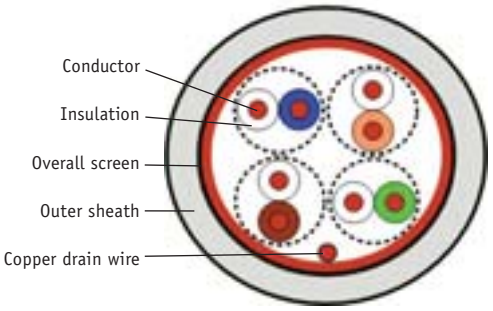
Article number	Size	Overall diameter mm	Weight kg/km	Copper number kg/km	Colour sheat
7KS50013	4P	5.3 (approx.)	32 (approx.)	21	grey RAL 7035
7KS50014	4P	5.3 (approx.)	32 (approx.)	21	yellow, RAL 1021
7KS50015	4P	5.3 (approx.)	32 (approx.)	21	green, RAL 6018
7KS50016	4P	5.3 (approx.)	32 (approx.)	21	blue, RAL 5015
7KS50017	4P	5.3 (approx.)	32 (approx.)	21	red, RAL 3000

Package: Drum 1,000 m

MegaLine® D1-20 F/U flex
$S_2P_0A_1C_2E_2$

Type: KS-02YS(ST)H 4x2xAWG 26/7

Construction:
Conductor: bare stranded copper wire, AWG26/7
Insulation: cellular-PE, core-Ø: max. 1.0 mm
Twisting element: Pair
Twisting: 4 pairs
Overall screen: aluminium bonded polyester tape, metal side inside, with underlayed tinned copper drain wire AWG 26/7
Outer sheath: halogen-free, flame retardend compound



Printing outer sheath:
KERPEN MegaLine® D1-20 F/U flex 4P H
SPACE CODE 20122
"Production lot code" "Meter marking"

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

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): 0.30 (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 5 acc. EN 50288 and IEC 61156
Bandwidth 200 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:
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

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

Application (Ethernet, TV)

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

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

Construction (Conductor size, Tensile strength)

Elektromagnetisches Verhalten:
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 > 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): 145 (max.)
Insulation resistance (Gohm x km): 500 (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): 18 (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	0.6	71	56	68	53	70	56	67	53	76	52	73	49	29.8	23
10	0.8	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/IEC 61156-6

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

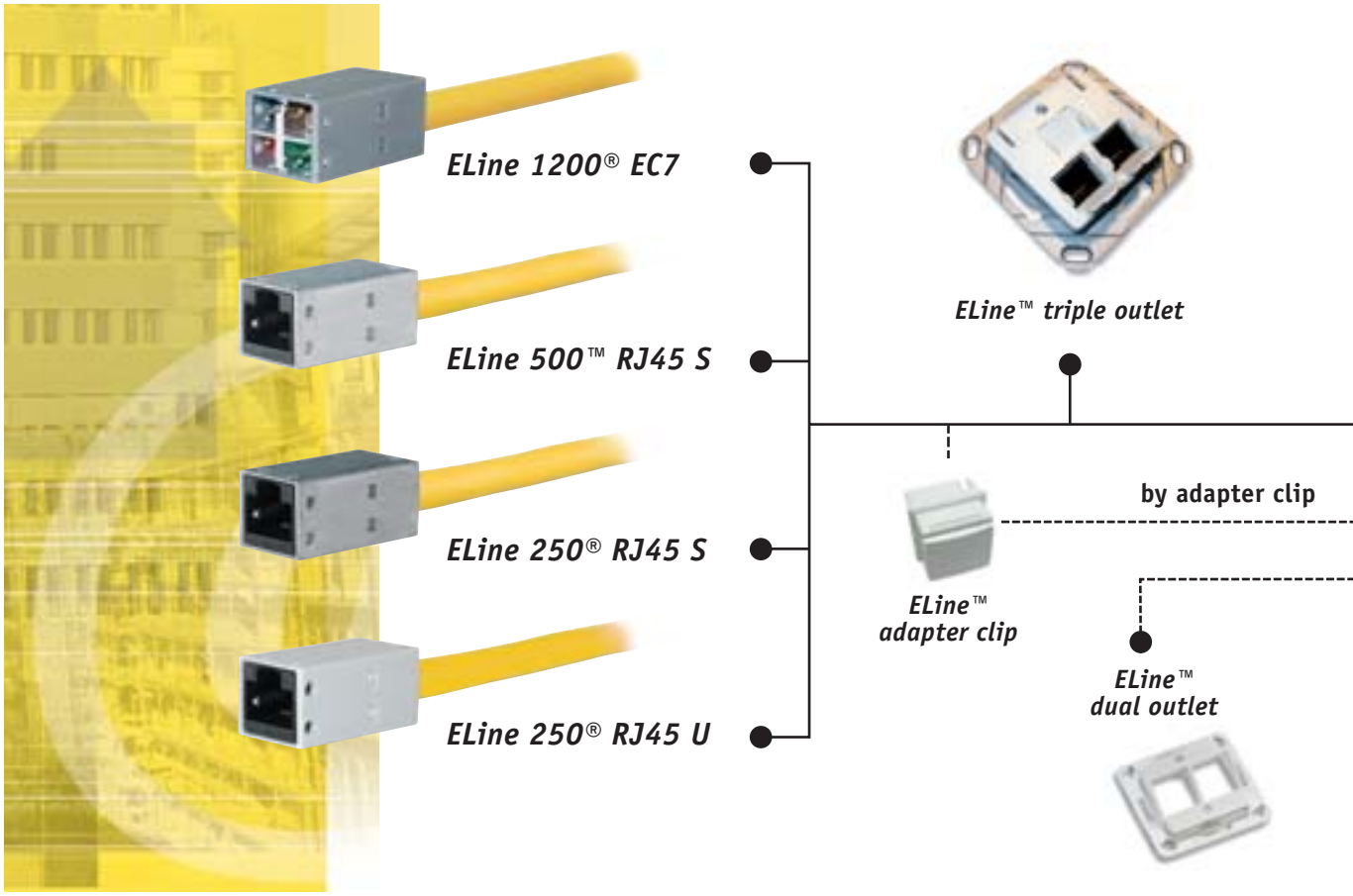
Certificates and Approvals:
Link performance: KERPEN ELine™ systems and further commercial cabling systems
Inspection certificate: acc. to DIN 55350-18-4.2.1 respectively EN 10204
In agreement to LVD (73/23/EEC): CE

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 number kg/km	Colour sheat
7KS50007	4P	5.0 (approx.)	26 (approx.)	16	grey, RAL 7035

Package: Drum 1,000 m

The ELine™ PREMIUM system



A combination meeting top requirements

The ELine™ PREMIUM system includes the modular jacks ELine 1200® EC7 for multimedia applications, ELine 500™ RJ45 S for Cat. "6_A" applications according to the draft 3.0 standard IEEE 802.3an for 10 GbE Ethernet via copper and ELine 250® RJ45 for Cat. 6 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™ 24-port panel, KERPEN also offers the ELine™ 48-port panel with double-density capacity on one rack unit only. 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 24 ports/1 U panel

ELine™ 48 ports/1 U panel

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

compatible with the PREMIUM series

ELine™ 32 ports/2 U panel

ELine™ 16 ports/1 U panel

ELine™ mini patch 6, 8 and 16 ports

	Multimedia shielded		**Class E_A / Cat. "6"$_A$ 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 F10-120 S/F F6-110 S/F	7KS80001 7KS01654 7KS01568 7KS70001 7KS70008	F10-120 S/F F10-110 S/F F6-90 S/F	7KS70001 7KS70008 7KS70010	F10-110 S/F F6-90 S/F F6-80 S/F E5-70 S/F E5-70 F/F	7KS70008 7KS70010 7KS70012 7KS60020 7KS60018	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 U 48 ports 1 U	9ZE30002 9ZE30008	24 ports 1 U 48 ports 1 U	9ZE30002 9ZE30008	24 ports 1 U 48 ports 1 U	9ZE30002 9ZE30008	24 ports 1 U 48 ports 1 U	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 1.0m RJ45-RJ45 2.0m RJ45-RJ45 3.0m RJ45-RJ45 5.0m RJ45-RJ45 10m	9KW2T010 9KW2T020 9KW2T030 9KW2T050 9KW2T100	RJ45-RJ45 1.0m RJ45-RJ45 2.0m RJ45-RJ45 3.0m RJ45-RJ45 5.0m RJ45-RJ45 5.0m	9KW26010 9KW26020 9KW26030 9KW26050 9KW26100	RJ45-RJ45 1.0m RJ45-RJ45 2.0m RJ45-RJ45 3.0m RJ45-RJ45 5.0m RJ45-RJ45 10 m	9KW79010 9KW79020 9KW79030 9KW79050 9KW79100

* Other floorbox holders on request

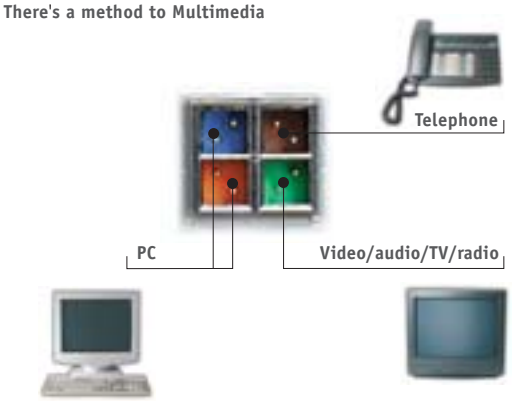
ELine 1200® EC7 – Multimedia up to 1.5 GHz via twisted pairs!

If a passive cabling system is connected with the term "multi-media", 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, 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® plug connector.

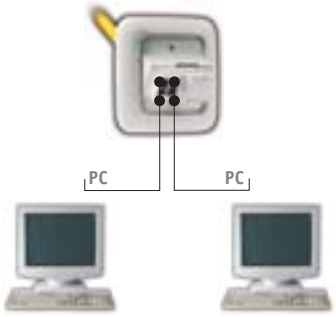
There's a method to Multimedia



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™ EC7 work area cords:

2 data services of Class A to F



Mixed telephone/data services

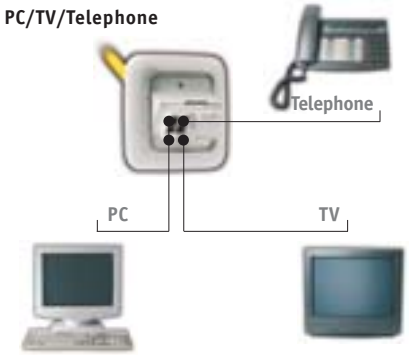
TV via twisted pairs!

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 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?

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 assembly time is reduced dramatically in comparison with the EC7 jack used up to now! 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!

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

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

ELine 500™ RJ45 S – a new cabling system for 10 Gigabit Ethernet

With ELine 500™ RJ45 S, KERPEN presents a new shielded RJ45 cabling system specially developed and optimised for the future transmission standard 10 Gigabit Ethernet (IEEE 802.3an).

Fig. 1: "The new ELine 500™ RJ45 S jack from KERPEN"

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.

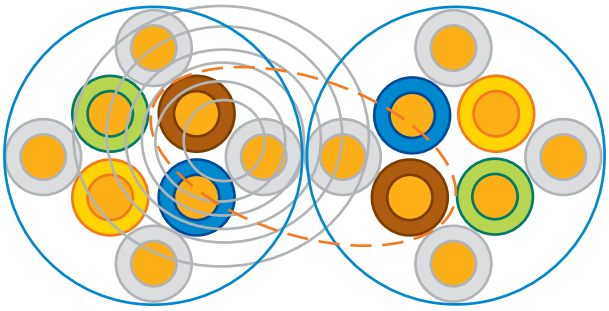


Fig. 2: "Diagram of Alien NEXT"

The use of shielded cabling is the safest and most economical method of reducing the Alien NEXT to a negligible value.

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. Evaluation is based on the channel requirements according to JTC1 SC25 N981 –

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.

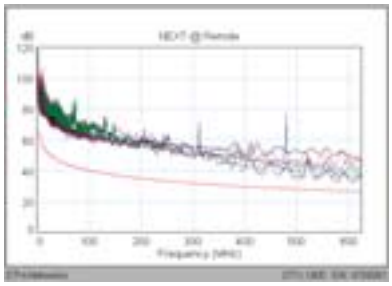


Fig. 3: "NEXT curve" up to 625 MHz

b) The RL curve shows excellent homogeneity of the components selected within the ELine™ 500 RJ45 S cabling system.

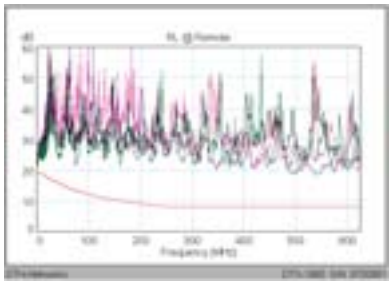


Fig. 4: "RL curve" up to 625 MHz

c) The ELFEXT of ELine 500™ RJ45 S behaves extremely safely, especially at the limits above 500 MHz.

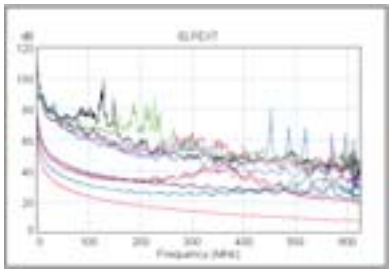


Fig. 5: "ELFEXT curve" up to 625 MHz

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 U 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 is a highly economical system with a high degree of investment protection!

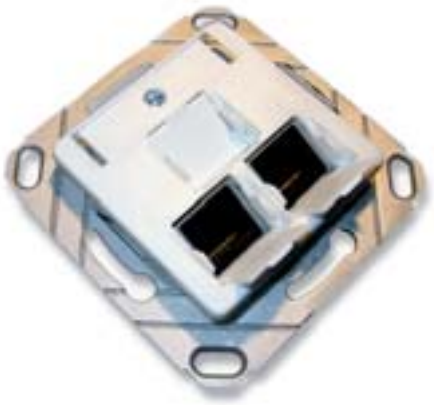
ELine 250® RJ45 – the real Category 6

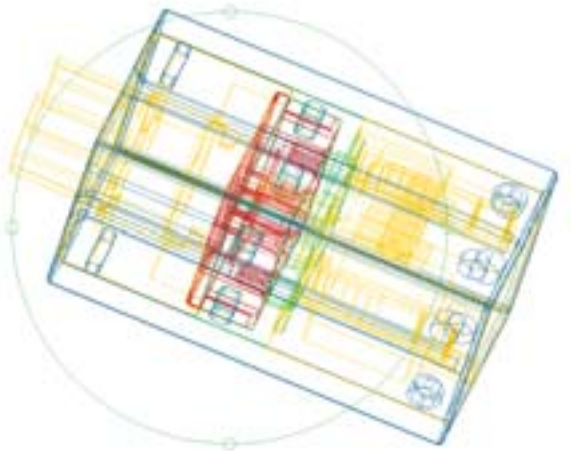
ELine 250® RJ45 S (shielded) and ELine 250® RJ45 U (unshielded)

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.





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.

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 HU provides room for 24/48 ports. Of course, the conventional panels in the ELine™ system can also be used via mounting clips.

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 electro-magnetic compatibility and supports EN 55022/50082.

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® F6-90 S/F flex.

Technical data

Compatible outlets/panels etc.

- See PREMIUM series (pages 58–59)

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, outlets and patch panels

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 number: 9ZE44444

Pcs. per packing unit: 8

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 number: 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 number: 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: 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 number: 9ZE30009

Pcs. per packing unit: 8

Jacks, outlets and patch panels

Multimedia – 1.5 GHz

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 250® RJ45 S, ELine 250® RJ45 U and ELine 1200® EC7 jacks
- Pure white, RAL 9010

Article number: 9ZE30010

Pcs. per packing unit: 8

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 and ELine 250® RJ45 U
- Pure white, RAL 9010

Article number: 9ZE30041

Pcs. per packing unit: 8

ELine™ PREMIUM patch panel, 1 U, 48 ports (RJ45/EC7)

483 x 1 U x 98 mm (WxHxD)

Product description:

- Without components, takes up a maximum of 48 jacks (including mixed media): ELine 250® RJ45 S, ELine 250® RJ45 U, ELine 250® EC7 on one U!
- Front panel light grey, RAL 7035
- Snap-in assembly
- Mounting clip not required
- Traction relief
- Earth connection

Article number: 9ZE30008

Pcs. per packing unit: 1

ELine™ patch panel, 1 U, 24 ports (RJ45/EC7)

483 x 1 U x 98 mm (WxHxD)

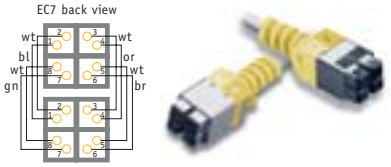
Product description:

- Without components, takes up a maximum of 24 jacks (including mixed media): ELine 250® RJ45 S, ELine 250® RJ45 U, ELine 1200® EC7
- Front panel light grey, RAL 7035
- Snap-in assembly
- Mounting clip not required
- Traction relief
- Earth connection

Article number: 9ZE30002

Pcs. per packing unit: 1

Patch cords and work area cords (data)

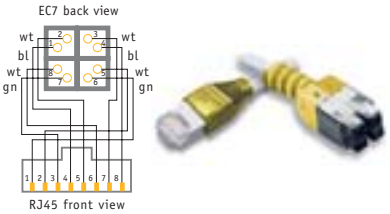


ELine 1200® EC7 patch cord/work area cord

Product description:

- 4P (7KS01189), 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 number:	9KEC1010
	9KEC1020
	9KEC1030
	9KEC1050
Pcs. per packing unit:	1

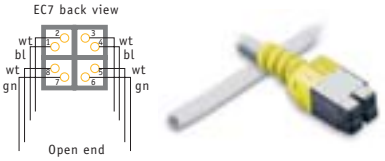


ELine 1200® EC7 patch cord/work area cord

Product description:

- 4P (7KS01189), light grey – RAL 7035
- A end equipped with 4-pair EC7 plug
- B end equipped with RJ45 plug
- Assignment EC7-RJ45
- Colour of bending protection sleeve EC7/RJ45: yellow
- Application: Gigabit Ethernet

Article number:	9KEC2010
	9KEC2020
	9KEC2030
	9KEC2050
Pcs. per packing unit:	1



ELine 1200® EC7 patch cord/work area cord

Product description:

- 4P (7KS01189), 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 number:	9KEC0010
	9KEC0020
	9KEC0030
	9KEC0050
Pcs. per packing unit:	1

ELine 1200® EC7 patch cord/work area cord

Product description:

- 2P (7KS01068), 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 number:	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

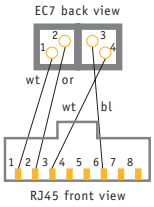
ELine 1200® EC7 patch cord/work area cord

Product description:

- 2P (7KS01068), 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 number:	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

Patch cords and work area cords (data)

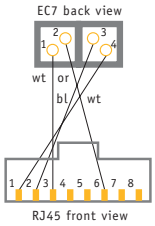


ELine 1200® EC7 patch cord/work area cord

Product description:

- 2P (7KS01068), 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 number:	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

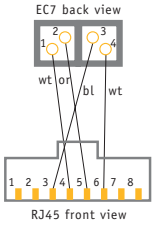


ELine 1200® EC7 patch cord/work area cord

Product description:

- 2P (7KS01068), 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 number:	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

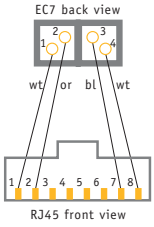


ELine 1200® EC7 patch cord/work area cord

Product description:

- 2P (7KS01068), 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: blue
- Application: Token Ring

Article number:	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



ELine 1200® EC7 patch cord/work area cord

Product description:

- 2P (7KS01068), 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 number:	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

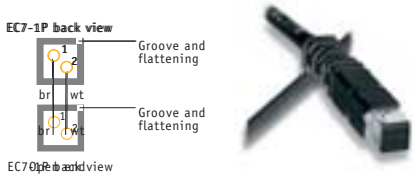
Patch cords and work area cords (telephone)

ELine 1200® EC7 patch cord/work area cord

Product description:

- 3 conductors (7KS01184), black
- A end equipped with 1-pair EC7 plug
- B end equipped with 1-pair EC7 plug
- Colour of bending protection sleeve: black
- Application: analog and digital telecommunication systems

Article number:	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 number:	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 number:	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

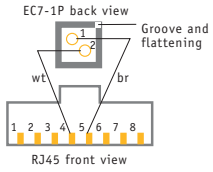
ELine 1200® EC7 patch cord/work area cord

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 number:	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

Patch cords and work area cords(telephone)

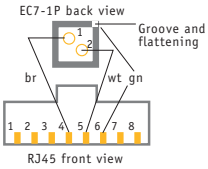


ELine 1200® EC7 patch cord/work area cord

Product description:

- 3 conductors (7KS01184), black
- A end equipped with 1-pair EC7 plug
- Colour of bending protection sleeve: black
- B end equipped with RJ45 plug
- Application: digital telephony

Article number:	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

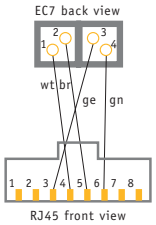


ELine 1200® patch cord/work area cord

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 number:	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® 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 number:	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 for CATV use

ELine 1200® EC7-CATV work area cord

Product description:

- 1 conductor (7KS01072), grey
- A end equipped with EC7 1P plug
- Colour of bending protection sleeve: black
- B end equipped with CATV balun 100/75 Ω F plug (slide-on)
- Additional adapter: F jack to IEC plug
- Application: CATV cable

Article number: 9KE30002 – 0.2 m
9KE30010 – 1.0 m

Pcs. per packing unit: 1

ELine 1200® EC7-CATV patch cord

Product description:

- 1 conductor (7KS01072), 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 number: 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 dual quadruple balun 75/100 Ω
(distributor insert)
49 x 26 x 103 mm (WxHxD)

Product description:

- Input: 2 x coax, F jack (75 Ω)
- Output: 2 x ELine 1200® EC7 jack (8x1P 100 Ω)
- Metal housing with cover and mounting thread, also suitable for earth connection
- When mounted in ELine 1200® EC7 distributor: occupies two ports
- 6 x terminating resistors
- Application: 2 x quadruple CATV balun function
- Only in conjunction with ELine™ patch panel (16 ports) (Article number 9ZE10127), see p. 77 – additional accessories

Article number: 9ZE10271

Pcs. per packing unit: 1

ELine 1200® EC7 equalizer

Product description:

- Input: coax, F jack (75 Ω)
- Output: coax, F jack (75 Ω)
- Switchable via jumper: 9 dB, 18 dB, 27 dB

Article number: 9ZE10242

Pcs. per packing unit: 1

Components for telephone use

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 U
- Rear connections 25 x 8 LSA
- Punch-down connections on 5 x 5 basic modules

Article number: 9ZE10221

Pcs. per packing unit: 1

Measuring equipment

ELine 1200® EC7 measuring adapter pair for Fluke DTX 1,800

(distributor insert)

49 x 26 x 103 mm (WxHxD)

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 number: 9ZE30038

Pcs. per packing unit: 1 pair

ELine 1200® E7 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 number: 9ZE30043

Pcs. per packing unit: 1

Other accessories for ELine 1200® EC7 and ELine 250® RJ45

ELine™ PREMIUM mini patch panel

457 x 47 x 82 mm (WxHxD)

Product description:

- Closed
- Without components
- For mounting on wall, floor or ceiling, in industrial environments etc.
- 16 dual ports to take up a maximum of 16 ELine 1200® EC7 or ELine 250® RJ45 jacks for mounting with adapter clip (Article number 9ZE30006)

Article number: 9ZE10106

Pcs. per packing unit: 1

ELine™ PREMIUM mini patch panel

237 x 47 x 82 mm (WxHxD)

Product description:

- Closed
- Without components
- For mounting on wall, floor or ceiling in industrial environments etc.
- 8 dual ports to take up a maximum of 8 ELine 1200® EC7 or ELine 250® RJ45 jacks for mounting with adapter clip (Article number 9ZE30006)

Article number: 9ZE10108

Pcs. per packing unit: 1

ELine™ PREMIUM mini patch panel

184 x 47 x 82 mm (WxHxD)

Product description:

- Closed
- Without components
- For mounting on wall, floor or ceiling, in industrial environments etc.
- 6 dual ports to take up a maximum of 6 ELine 1200® EC7 or ELine 250® RJ45 jacks for mounting with adapter clip (Article number 9ZE30006)

Article number: 9ZE10007

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 and ELine 1200® EC7 jacks to existing patch panels/ outlets from the old ELine™ range
- Pure white, RAL 9010
- Hinged dust protection cover

Article number: 9ZE30021

Pcs. per packing unit: 8

Other accessories for ELine 1200® EC7 and ELine 250® RJ45

ELine™ PREMIUM patch panel, 1 U

485 x 44 x 150 mm (WxHxD)

Mounting depth: 148 mm

Product description:

- Without components
- Takes up a maximum of 16 ELine 1200® EC7 or ELine 250® RJ45 jacks for mounting with adapter clip, Article number 9ZE30006
- 1 U
- Light grey, RAL 7035

Article number: 9ZE10127

Pcs. per packing unit: 1

ELine™ PREMIUM patch panel, 2 U

485 x 88 x 150 mm (WxHxD)

Mounting depth: 148 mm

Product description:

- Without components
- Takes up a maximum of 32 ELine 1200® EC7 or ELine 250® RJ45 jacks for mounting with adapter clip, Article number 9ZE30006
- 2 U
- Light grey, RAL 7035

Article number: 9ZE10128

Pcs. per packing unit: 1

Other accessories for ELine 1200® EC7 and ELine 250® RJ45

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 number:	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 number:	9ZE10104
Pcs. per packing unit:	1

ELine™ PREMIUM assembly tool

Product description:

- For simple, safe connection of the jacks
  ELine 250® RJ45 S
  ELine 250® RJ45 U and
  ELine 1200® EC7

Article number:	9ZE30007
Pcs. per packing unit:	1

ELine™ 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 number: 9ZE60006

Pcs. per packing unit: 1

ELine™ floorbox insert

Product description:

- GES6 insert for a maximum of 2 mounting plates
- For mounting in Ackermann floor-box 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 fibre 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 number: 9ZE60001

Pcs. per packing unit: 1

ELine™ floorbox insert

Product description:

- GES6 insert for a maximum of 3 mounting plates
- For mounting in Ackermann floor-box 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 fibre 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 number: 9ZE60002

Pcs. per packing unit: 1

The ELine™ NOVUM system

ELine 600® GG45
+ adapter clip

ELine 250® MLS
RJ45 Cat. 6, shielded

ELine 250® MLU
RJ45 Cat. 6,
unshielded

ELine™ wall outlet MLS/MLU
(86 x 86 mm)

ELine 250® MLU and ELine 250® MLS – with flexible NOVUM technology

The universal NOVUM technology is a concept for flexibly combining ELine™ jacks of different power stages with NOVUM outlets and panels.
At the centre of the NOVUM series are RJ45 ELine 250® MLU (unshielded) and ELine 250® MLS (shielded) jacks*.
Extremely easy mounting and good performance in conjunction with MegaLine® data cables guarantee optimum value for money!

* Both models can be mounted in the NOVUM panel and the NOVUM outlets

ELine™ wall outlets MLS/MLU (45 x 45 mm)

ELine™ wall outlets MLS/MLU (80 x 80 mm)

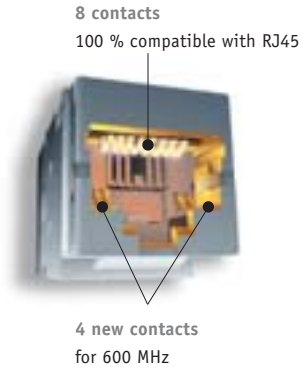
ELine™ 24 port/1U panel GG45 MLS/MLU

	Class F / Kat. 7		Class E / Cat. 6 shielded		Class E / Cat. 6 shielded	
	ELine 600® GG45	Article no.	ELine 250® RJ45 MLS	Article no.	ELine 250® RJ45 MLU	Article no.
MegaLine® cable	SY22 SY23	7KS01654 7KS01568	E5-70 S/F E5-70 F/F E2-45 F/F E2-45 U/F E2-30 F/U	7KS60020 7KS60018 7KS60014 7KS60005 7KS60004	E2-30 U/U	
ELine™ jack	GG45 (Keystone)	9ZE20001	MLS (Keystone)	9ZK00023	MLU (Keystone)	9ZK00002
ELine™ outlet	German 50 x 50 mm 2 p	9ZE20005	german 80 x 80 mm 50 x 50 mm 2p flat german 80 x 80 mm 50 x 50 mm 2p 45° french 80 x 80mm 45 x 45 mm 1p flat french 80 x 80 mm 45 x 22,5 mm 2p flat GB 86 x 86 mm 50 x 60 mm 2p flat GB 86 x 86 mm 50 x 60 mm 2p 45°	9ZK00005 9ZK00004 9ZK00011 9ZK00010 9ZK00007 9ZK00006	german 80 x 80 mm 50 x 50 mm 2p flat german 80 x 80 mm 50 x 50 mm 2p 45° french 80 x 80mm 45 x 45 mm 1p flat french 80 x 80 mm 45 x 22,5 mm 2p flat GB 86 x 86 mm 50 x 60 mm 2p flat GB 86 x 86 mm 50 x 60 mm 2p 45°	9ZK00005 9ZK00004 9ZK00011 9ZK00010 9ZK00007 9ZK00006
ELine™ panel (Keystone)	19", 1 U, 24 Port	9ZK00024	19", 1 U, 24 Port	9ZK00024	19", 1 U, 24 Port	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	9KW26010 9KW26020 9KW26030 9KW26050 9KW26100	RJ45-RJ45 1 m RJ45-RJ45 2 m RJ45-RJ45 3 m RJ45-RJ45 5 m RJ45-RJ45 10 m	9KW79010 9KW79020 9KW79030 9KW79050 9KW79100

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.

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.

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.

Class E

Class F

GG45 is a registered trademark of Nexans HQ, Paris

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!

Compatibility matrix

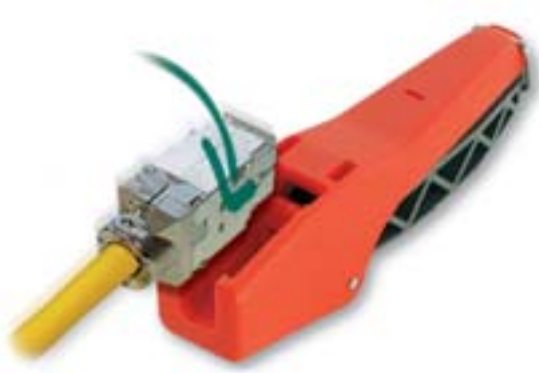
Jack	Plug	Cable	Performance of channel
GG45	GG45	1,000 MHz	1,000 MHz
GG45	GG45	250 MHz	250 MHz
GG45	RJ45	500 MHz	250 MHz (depending on quality of RJ45)
RJ45	GG45	600 MHz	Not compatible

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.

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 two system cables MegaLine® SY22 (AWG 22) and SY23 (AWG 23), KERPEN offers two system cables specially designed for this connector which make it much easier to install.

Optimum performance – certified

Measurements by the "Gesellschaft für Hochfrequenz-technik" 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.

Who needs Class E and F?

If it's a secure future and reserve performance you're after, the answer is obvious: everybody does! One look at the current standardisation shows that Cat. 5/Class D is being phased out.
Use for 1,000BASE-TX specified in draft standard 4657-1 of ANSI TIA/EIA-854 requires a Class E cabling. In contrast to the Gigabit Ethernet standard 1,000BASE-T used up to now, this standardisation project includes only 2 pairs each for transmitting and receiving, i.e. it allows a considerable reduction in the Gigabit Ethernet cards required ("low-cost Gigabit Ethernet").
Cell-based 1,000 Mbit/s (CB1G), the use specified by the ATM Forum in af-phy-0162000, is not supported by Class D/Cat. 5 cabling.
Applications requiring Class F are also planned. Key word: Standardisation for TP and Fibre Channel via Class F (ISO/IEC CD 14165-114).

However, the largest project of all is 10 GbE via copper: IEEE 802.an is to support 10 GbE via Class F (100 m).

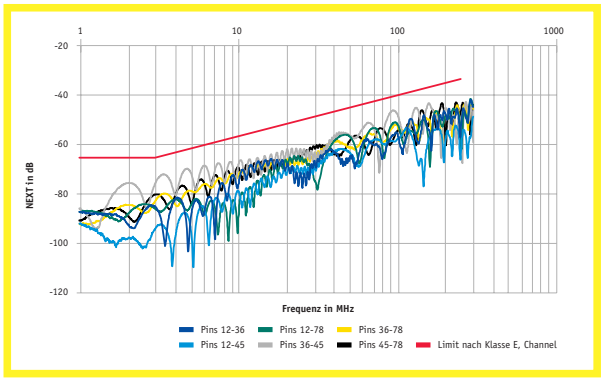
Class F and multimedia

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.

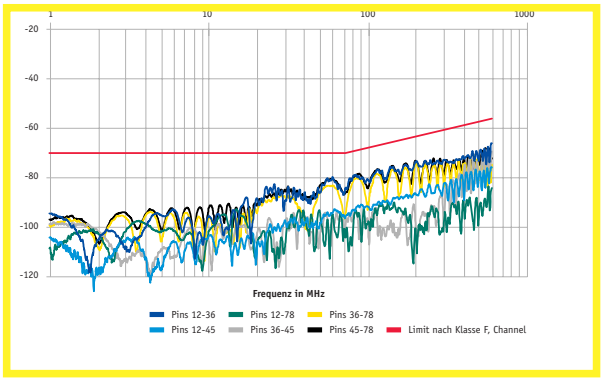
Conclusion:

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® G45 for a Class E and F cabling, for example in conjunction with the MegaLine® SY22 and SY23 GG45 system cable!



NEXT Class E



NEXT Class F

Technical data

Compatible outlets/panels etc

- NOVUM (see p. 80–81) and ELine 600® GG45

Category

- Mode 1: Cat. 6 IEC 60603-7-4 FJ45 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 cable

- Recommended system cable:
  MegaLine® SY22
  Article number: 7KS01654
- MegaLine® SY23
  Article number: 7KS01568

Certificate

- GHMT certificate for RJ45 Mode Category 6/Class E
- GHMT certificate for GG45 Mode Category 7/Class F 600


Zertifikat

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: 9ZK00023)
  or
- Unshielded (ELine 250® MLU, Article number: 9ZK00002)
- Connection method: 110 type punch-down, gas-tight
- Recommended conductors: AWG 24 / AWG 23
- Colour coding according to 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

Category 6/7 – 250/1,000 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 number: 9ZE20001

Pcs. per packing unit: 8

ELine 250® MLS RJ45 jack, shielded

Product description:

- Shielded
- 8-pole RJ45 jack
- Suitable for use in patch panels and outlet inserts of the NOVUM series (see page 88–89)
- Category 6

Article number: 9ZK00023

Pcs. per packing unit: 1

ELine 250® MLS RJ45 jack, unshielded

Product description:

- Shielded
- 8–pole RJ45 jack
- Suitable for use in patch panels and outlet inserts of the NOVUM series (see page 88-89)
- Category 6

Article number: 9ZK00002

Pcs. per packing unit: 24

Jacks, outlets and patch panels

Category 6/7 – 250/600 MHz

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 MLS/MLU or mixed media
- Front panel: light grey RAL 7035
- Extremely easy to mount
- Traction relief on back
- Can be earthed via screw connection

Article number: 9ZK00024

Pcs. per packing unit: 1

ELine 600® GG45 patch panel, 24 ports 4 x 6

19", 1 U, 480 x 44 x 135 mm (WxHxD)

Mounting depth: 155 mm

Product description:

- Without components
- Steel design, can be equipped with up to 24 ELine 600® GG45 outlets, 4 x sextuple mounting clips, snap-in assembly of outlets, clip-on cable guide with large-surface shield contacting, insertable marking strips, front panel
- Scope of delivery: Modular patch panel, marking strips
- Colour: light grey, RAL 7035

Article number: 9ZE20012, fixed – 9ZE20010, telescopic

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 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 number: 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 number: 9ZE20004

Pcs. per packing unit: 8

Jacks, outlets and patch panels

ELine 250® ML dual outlet insert

86 x 86 mm (WxH)

Product description:

For a maximum of
- 2 x RJ45 ELine™ MLS (9ZK00023) or 2 x RJ45 ELine™ MLU (9ZK00002)
- or mixed media
- Pearl white, RAL 9016

2 models: 45° – Article number: 9ZK00006

Pcs. in packing unit: 12

90° – Article number: 9ZK00007

Pcs. in packing unit: 12

ELine 250® ML dual outlet insert

80 x 80 mm (WxH)

Product description:

For a maximum of
- 2 x RJ45 ELine™ MLS (9ZK00023) or 2 x RJ45 ELine™ MLU (9ZK00002)
- or mixed media
- Pure white, RAL 9010

2 models: 45° – Article number: 9ZK00004

Pcs. in packing unit: 12

90° – Article number: 9ZK00005

Pcs. in packing unit: 30

ELine 250® ML single outlet insert

45 x 45 mm (WxH)

Product description:

For a maximum of
- 1 x RJ45 ELine™ MLS (9ZK00023) or 1 x RJ45 ELine™ MLU (9ZK00002)
- Pure white, RAL 9010

Model: 90° – Article number: 9ZK00011

Pcs. in packing unit: 12

ELine 250® ML single module for outlet insert

22.5 x 45 mm (WxH)

Product description:

ELine™ single outlet insert for dual outlet
- 1 x RJ45 ELine™ MLS (9ZK00023) or 1 x RJ45 ELine™ MLU (9ZK00002)
- Pure white, RAL 9010

Model: 90° – Article number: 9ZK00010

Pcs. in packing unit: 24

Jacks, outlets and patch panels

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 number: 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 or simple, safe moulding of the ELine 600® GG45 jack

Article number: 9ZKE20006

Pcs. per packing unit: 1

ELine 250® ML assembly tool

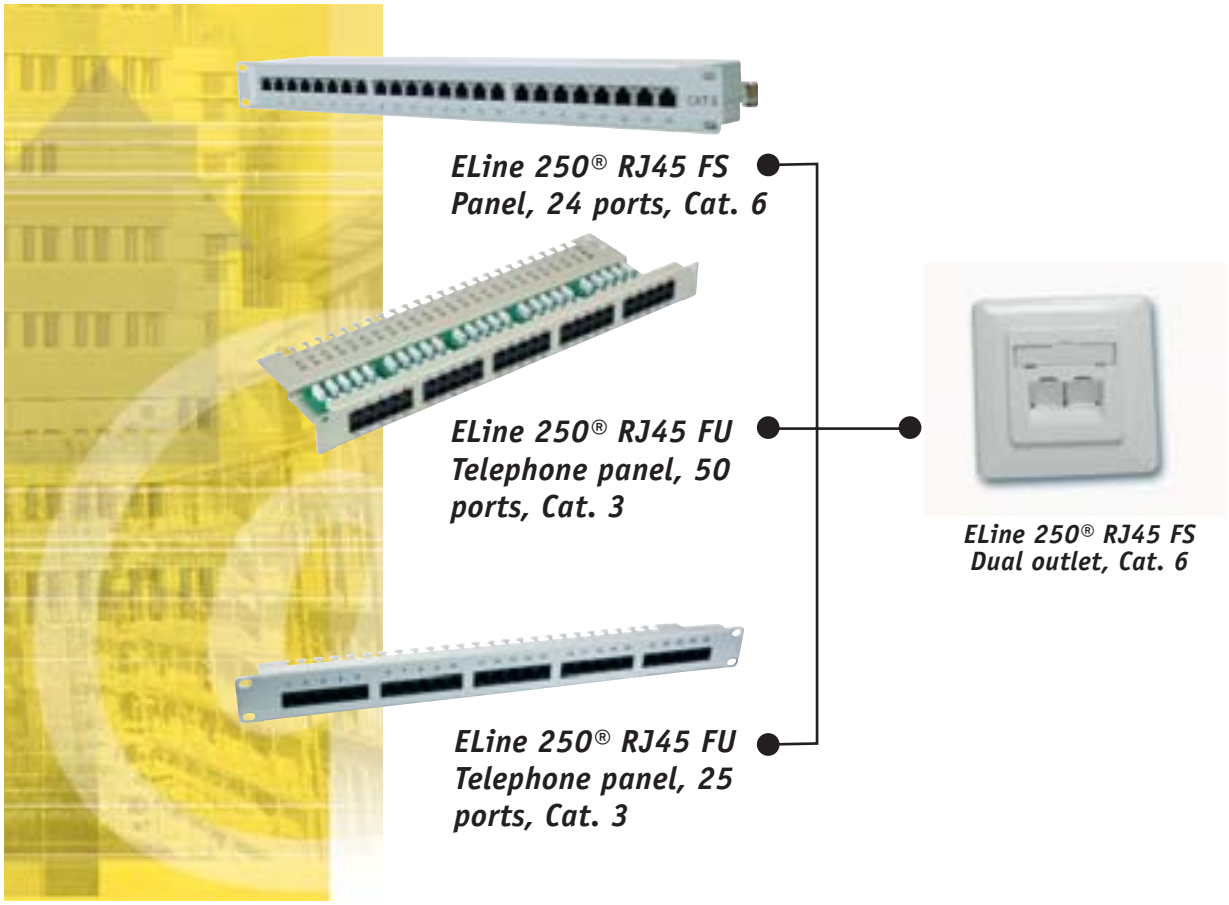
Product description:

- For simple, safe connection of the jacks ELine 250® RJ45 MLS/MLU

Article number: 9ZK00009

Pcs. per packing unit: 1

The ELine™ FIXUM system



ELine 250® RJ45 FS
Cat. 6 LSA solution

ELine 250® RJ45 FS offers 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.

LSA products

ELine 250® RJ45 FIXUM panel, 24 ports, shielded

19", 1 U 483 x 44 x 98 mm (WxHxD)

Product description:

- 24-port RJ45 panel, shielded, Cat. 6
- Rear connection via 8-pole LSA punch-down connection strips
- Suitable for solid conductors AWG 22-26
- Short assembly time
- Suitable for mounting in 19" cabinets
- Colour: pure white, RAL 7035

Article number: 9ZE70001

Pcs. per packing unit: 1

ELine 250® RJ45 FIXUM dual outlet, shielded

80 x 80 mm

Product description:

- Outlet for cable duct, surface, concealed and floor-box mounting
- Two RJ45 slots, Cat. 6
- Rear LSA punch-down connections suitable for solid conductors AWG 22-26
- Colour coding according to EIA / TIA 568 A + B
- Short assembly time

Cable guide right/left	Cable guide right/left
Article number: 9ZE70002 (RAL 9010)	Article number: 9ZE70005 (RAL 1013)
Pcs. per packing unit: 1	Pcs. per packing unit: 1
Cable guide top/bottom	Cable guide top/bottom
Article number: 9ZE70006 (RAL 9010)	Article number: 9ZE70007 (RAL 1013)
Pcs. per packing unit: 1	Pcs. per packing unit: 1

ELine™ FIXUM telephone patch panel, 50 ports

19", 1 U 483 x 44 x 92 mm (WxHxD)

Product description:

- Suitable for ISDN applications
- Connections: front: 50 x RJ45 jacks, unshielded
- Rear: 4 x 50 LSA punch-down connections
- Connection method: punch-down connections suitable for solid conductors up to AWG 22
- Assignment: pin 3, 4, 5, 6
- Colour: light grey, RAL 7035

Article number: 9ZE70004

Pcs. per packing unit: 1

ELine™ FIXUM telephone patch panel, 25 ports

19", 1 U 483 x 44 x 92 mm (WxHxD)

Product description:

- Suitable for ISDN applications
- Connections: front: 25 x RJ45 jacks, unshielded
- Rear: 4 x 25 LSA punch-down connections
- Connection method: punch-down connections suitable for solid conductors up to AWG 22
- Assignment: pin 3, 4, 5, 6
- Colour: light grey, RAL 7035

Article number: 9ZE70003

Pcs. per packing unit: 1

Acceptance tests for ELine™ cabling systems

The acceptance tests for ELine™ cabling systems are carried out according to the requirements of ISO/IEC 11801 / EN 50173, 2nd Edition, for channels and permanent links.
Further standards related to acceptance tests (execution of tests): DIN EN 50346 and DIN EN 61935

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
Asymmetry attenuation/dB	–	–	–	–	–
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

Max. loop resistance 25 ohm
Max. loop resistance asymmetry 0.75 ohm

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	–
Asymmetry attenuation/dB	–	–	–	–	–
Time delay/µs	0.580	0.553	0.548	0.546	–
Time delay difference/µs	0.050	0.050	0.050	0.050	–

Max. loop resistance 25 ohm
Max. loop resistance asymmetry 0.75 ohm

In situ measurement according to Class F

In order to guarantee customer satisfaction, in-situ measurement is becoming more and more important for the approval of a system after installation. Customers who have installed a high-quality Class F system are increasingly demanding proof that the promised specifications are complied with over the entire frequency range of Class F up to 600 MHz as an expression of the high quality of their systems. With the two systems ELine 1200® and EC7 and ELine 600® GG45, KERPEN offers not one but two cabling platforms suitable for Class F. State-of-the-art in-situ measurement techniques are used for approval measurements and certifications according to Class F. In the field of Class F in-situ measuring, KERPEN works with the manufacturers Ideal and Fluke in order to measure the performance in the permanent link and in the channel. Measuring instruments from both manufacturers can also be used with their RJ45 adapters for measuring according to Draft Class E_A.

Standard Class F acceptance testing according to ISO/IEC 11801 and EN 50173 up to 600 MHz:
Recommended measuring instruments and adapters:

- IDEAL LANTEK 7G
  (ELine 1200® EC7 Fluke and ELine 600® GG45 adapters available from IDEAL Ind.)
- Fluke DTX1,800
  (ELine 1200® EC7 adapter available from KERPEN, Article number 9ZE30038)

IDEAL

Ideal Industries LANTEK 7G

Fluke

Fluke DTX1,800

Measuring adapter for the ELine 1200® EC7 cabling system:

Measuring adapter for the ELine 600® GG45 cabling system:

In the acceptance testing of a GG45 cabling system according to Class F, separate Class E testing of the RJ45 contacts is no longer necessary as full testing of the jacks is carried out by the manufacturer.

Acceptance testing ELine 250® RJ45 S
ELine 250® RJ45 U
ELine 250® MLS
ELine 250® MLU
ELine 250® MLU
ELine 250® FIXUM

Standard acceptance testing up to 250 MHz

- Acceptance testing according to Class E – 250 MHz permanent link
- Recommended measuring instruments (as of May 2004):

– Fluke: OMNIscanner2, OMNIscanner, DSP 4300, DSP 4100 or DSP 4000, DIX 1,800
IDEAL: LANTEK 7, LANTEK 6
(Information on other recommended measuring instrument on request)

For user information please go to:
www.idealindustries.de
www.fluke.com

A selection of measuring instruments (examples):

Fluke OMNIScanner2

Fluke DSP 4300

IDEAL Industries LANTEK 7