



**VarioLine®**  
**System periphery in copper and fiber**  
for DataCenter · Office · Industry

**The Quality Connection**

**LEONI**



# Modular, robust and easy to install

## VarioLine® system periphery

VarioLine® is perfectly matched to the modular LEONI MegaLine® Connect100, MegaLine® Connect45 and VarioKeystone® connecting systems.

All systems with Keystone dimensions and common fiber optic cable couplings can be integrated.

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All necessary planning documentation available online:  
[www.leoni-infrastructure-datacom.com](http://www.leoni-infrastructure-datacom.com)

**Technical changes, errors and omissions without prior notice.**

### Safety instructions

Cables are to be used for the designated applications only. Maintenance, repair and replacement of cables and plugs must be carried out by authorised and trained personnel.

### General conditions of sale and delivery

We refer to the currently valid General conditions of sale and delivery which can be obtained from us.

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# The LEONI Group

Cable expertise for the most varied industrial markets



**LEONI is a leading supplier of cable systems and related services for the automotive industry and various other industrial sectors.**

Our group of companies employs more than 61,000 people in 33 countries. Corporate vision, highest quality and innovative power have made us one of the leading cable manufacturers in Europe. LEONI develops and produces technically sophisticated products ranging from wire and optical fibers to cables through to complete cable systems and also offers the related services. Moreover, the product portfolio comprises strands, standardised cables, hybrid cables, glass fiber as well as special cables, cable harnesses, wiring systems components and fully assembled systems for applications in various industrial markets.

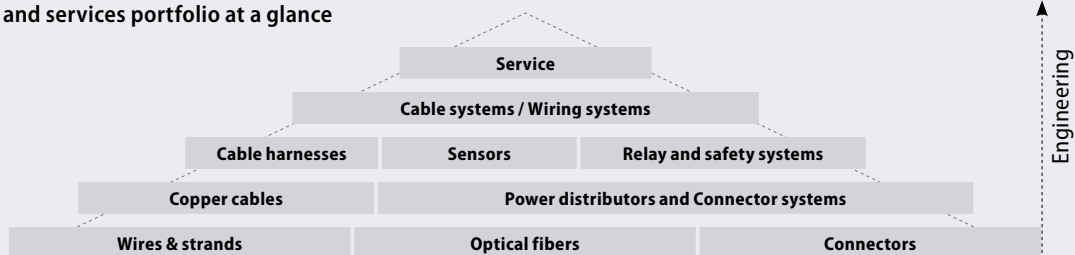
## Your markets – our strength.

As diverse as our product and service range are the markets and sectors LEONI is supplying. We focus our activities on customers in the fields of Automotive & Commercial Vehicles, Industry & Healthcare, Communication & Infrastructure, Electrical Appliances and Conductors & Copper Solutions.

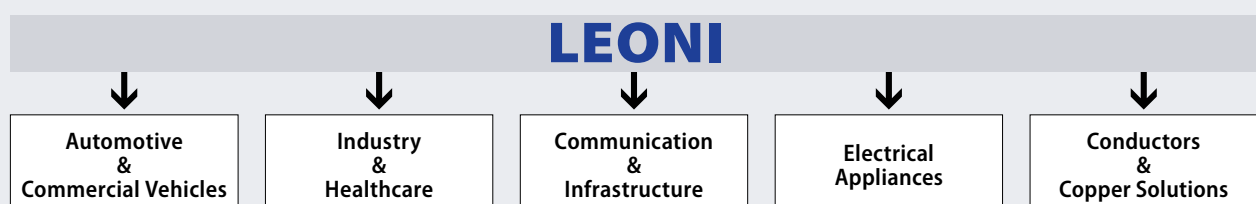
We are among the leading European suppliers in the Communication & Infrastructure market to which at LEONI as a cable manufacturer also belong activities in the fields of Infrastructure & Data Communications, Industrial Plant Projects, Solar & Wind-power, Energy & Telecommunications, Irradiation Cross-Linking and Traffic Engineering. Our customers benefit worldwide from innovative as well as reliable and long-lasting products of high quality. LEONI – we create the best connection for your future.

For further information [www.leoni.com](http://www.leoni.com)

## Products and services portfolio at a glance



## LEONI's core markets



# Future-proof complete solutions

For building infrastructure cabling in energy and data technology



## Business Unit Infrastructure & Datacom

The demands on traffic, data and infrastructure networks will rise in the future. Larger data bandwidths, global networking and increasing individual traffic are associated with constraints on resources, cost pressures and environmental protection. Providing efficient, sustainable and safe power supply as well as energy and data distribution in buildings is the demand of tomorrow. LEONI's business unit Infrastructure & Datacom has realised these insights for quite some time and produces the quality connections of the future today already. Together with the Energy & Communication business unit, LEONI offers future-proof complete solutions for building infrastructure cabling in energy and data technology.

### **BETAflam® – The innovative energy supply of tomorrow**

The exponentially increasing energy consumption is rising along with the growing urbanisation and mobility and also determines the trends in the energy industry. We try to face these insights successfully today already. With our products and services for energy production and distribution we want to make an active contribution to the prevention of today's energy loss in the future. Energy and communication will inevitably merge in the future. With the focus on intelligent energy grids we contribute to sparing the environment, resources and costs.

### **BETAfixss® – For maximum safety in building cabling**

As a leading supplier in the market of structured building cabling, we combine competencies – in energy and communications networks, public buildings, civil engineering, offices, data centres and industry. While increasingly complex applications confront the infrastructure with new challenges, we are obligated to provide maximum safety everywhere. Flexible system and connection solutions also make it possible to be prepared for tomorrow's connections today.

### **MegaLine®, GigaLine®, VarioLine® – Data networks of the future**

In order to do justice to the future exchange of data, we already offer cabling systems that are structured and a safe investment. Bigger volumes of data, cloud computing, global linking and easily scalable data networks will shape the future. Requirements that we are confronting with innovative, safe and sustainable high-grade glass fiber and copper cables and modular cabling and connection systems.

### **BETAsolution® – Cost-efficiency in every stage of the project**

Our service package BETAsolution® provides on-site consulting from planning, projecting to logistics and installation all the way to project acceptance. Rising costs and time pressures combined with ever-higher requirements for materials and sustainability call for increasingly efficient project management. Major projects like the Gotthard Base Tunnel in Switzerland benefit not only from the comprehensive range but also from our knowledge and skill. BETAsolution® reduces interfaces and considerably increases project efficiency. Specialists ensure comprehensive complete solutions worldwide and thus create a true competitive edge for our clients.

Our long-standing tradition of producing innovative cable products is our pledge to constant peak performance. Starting with our competence centres in Däniken (Switzerland) and Stolberg (Germany), it is necessary to always plan ahead in the fields of development and research for our products. Connecting tomorrow's world today already then also means looking ahead. Constant advancement and research is our claim in this. We see complexity as a challenge. Being innovative to us means moving forward and simultaneously trusting in our competencies. We create connections that link people safely, quickly and convincingly – today and tomorrow.

For further information [www.leoni-infrastructure-datacom.com](http://www.leoni-infrastructure-datacom.com)

## Great brands, great service

Put your trust in the best partner to suit your needs

Our commitment to developing innovative products proves our dedication to our responsibility. In conjunction with our consulting services, we create trust and help our partners accomplish maximum safety for people and infrastructure in their projects.

Investors, integrators, designers, installers and the trade – you can now get all your cabling, connectivity and complete cabling solutions from a single source – from copper and fiber optic technology to halogen-free energy cables, with or without circuit integrity. Constant safety, environmental compatibility and energy efficiency innovations complete the list of customer benefits.

Global presence, consulting on site during all stages of a project as well as extensive experience gained in numerous projects and far-reaching synergies inside and outside the LEONI Group makes us international one of the most accredited partners in the field of building and infrastructure cabling.



### Infrastructure –

for maximum safety in cabling for buildings

Our products set the standard worldwide – in buildings, in underground construction and in traffic infrastructure. Our cables based on our proprietary patented design and production processes ensure maximum safety and performance. The halogen-free, fire-resistant insulation materials meet all the relevant standards while their extended service life also presents a compelling advantage. Whether as laying systems or highly complex network systems, our full infrastructure range convinces customers worldwide.

- **BETAflam®** according to the VDE standard  
Safety and installation cables
- **BETAflam®** according to the British Standard BS 6387  
Safety and installation cables
- **BETAfixss®** with circuit integrity under fire acc. to DIN 4102  
Certified installation systems



## Datacom –

for maximum data integrity and bandwidth

From the very beginning of the digital data era, we have fulfilled data networking requirements for both the short term and the far future by using great innovation and a forward-looking approach. The profound expertise of the Infrastructure & Datacom BU in copper and fiber optical cabling technologies represents a powerful advantage in structured cabling systems for industry, data centres and offices – the sustainable copper and glass fiber cables of our own production are among the safest and most innovative products in the primary to tertiary cabling market.

- **MegaLine®**  
Copper cables and passive system components
- **GigaLine®**  
Fiber optical cables and passive system components
- **VarioLine®**  
Modular system peripherals

## Energy –

the best connection for energy supply

With innovative and sustainable solutions we face the dynamic development in the energy and communication market today already. As one of the leading system and development partners for energy production, transmission and distribution, we accept the responsibility for safe and sustainable energy supply. Our low- and medium-voltage power cables provide convincing durability and resist even the most adverse conditions.

- **BETApower®**  
Cable for power generation
- **BETAsolution®**  
Cost-effectiveness at every phase of the project

## Green Technology

Our company aim is to combine innovation with sustainability.



Our vision is to create sustainable connections in technological harmony with the natural resources. The cycle of nature gives us the best model to emulate. It is our responsibility to learn from nature and make use of it while conserving it and treating it with care. The growing scarcity of the natural resources and the increasing burden on the environment require a rethink on all levels of society. For LEONI, sustainability is an integral part of group policy. We are the first cable manufacturer in the world to develop a holistic concept for "green technology".

While trends like globalisation, mobility and urbanisation also determine the markets, sustainability and global responsibility are a central credo. To be considered the most innovative cable manufacturer for environmentally friendly technologies – that is our goal. At that, it is of vital interest to us to detect the needs and requirements of tomorrow today and supply the markets of the future with sustainable, future-proof solutions.

Green technology stands for the resource-conserving and low-emission production of sustainable quality cables made with low-pollution elements. We constantly work at optimising the efficiency with which resources are used in the manufacturing process by deploying energy-efficient machines or taking heat recovery measures. More and more locations in our global production network are environmentally certified according to the ISO 14001 standard.

As a worldwide active and leading European supplier of wires, optical fibers, cables and cable systems for communication and infrastructure projects it is our responsibility to constantly optimise the sustainability and durability of our products, system solutions and services and thus lower the environmental load. We have to increase the amount of environmentally compatible raw materials in our cable products as well as the recyclability of processed materials or components and in doing so create end products that are developed for the environmental standard of tomorrow today.

In conjunction with the ecological compatibility, future technologies are measured in terms of efficiency, service life, emission reduction and the conservation of natural resources. Innovative cable products and systems, holistic solutions and maximum performance in project management are the added value which we offer to our customers and business partners. These are also our cornerstones for strong connections into the future.



There are various environmental directives in the European Union (EU). Directive 2012/19/EU WEEE (Waste Electrical and Electronic Equipment) regulates the disposal of electrical and electronic equipment and components. The use of certain hazardous materials in electrical and electronic devices is defined by Directive 2011/65/EU RoHS 2 (Restriction of Hazardous Substances). Chemicals and materials in general are regulated by the law on chemical substances 1907/2006/EC REACH (Registration, Evaluation, Authorisation and Restriction of Chemicals).

This means avoiding the following substances, among others:

- Polybrominated diphenyl ether (PBDE)
- Decabromodiphenyl ether (DecaBDE)
- Perfluorooctane sulfonate (PFOS)
- Pentabromodiphenyl ether (PentaBDE)
- Octabromodiphenyl ether (OctaBDE)
- Lead (Pb)
- Mercury (Hg)
- Cadmium (Cd)
- Hexavalent chromium (Cr VI)
- Polybrominated biphenyls (PBB)



Cables and conductors and their associated connectors are only affected by Directive 2012/19/EU WEEE insofar as they are an internal part of the listed equipment and components.

Cables and conductors have now been included in 2011/65/EU RoHS 2 since 2013 for the first time (Category 11 or as an internal component of the respective product). Fiber optic cables, power cables (>250 V) and installed fixed cables e.g. in premises are not concerned. The only permissible marking according to RoHS 2 is the CE marking, which is printed on the product package.

EU Directive 2012/19/EU on waste electrical and electronic equipment.

EU Directive 2011/65/EU for restriction of the use of certain hazardous substances in electrical and electronic equipment.

EU Regulation 1907/2006/EC (REACH) the chemical regulation of the European Union.



**REACH**

### What does REACH mean?

REACH stands for Registration, Evaluation, Authorisation and Restriction of Chemicals.

With REACH, the previous chemical law is basically harmonised, simplified and valid in all EU Member States.

Under REACH, there is a so-called candidate list with substance of very high concern (SVHC), which are subject to obligatory information and should be substituted in the long run. The list of candidate materials is updated twice per year by the European Chemicals Agency (ECHA) in Helsinki.

# Technologies – investment in sustainable security

Universal application with high system integrity



Our development and production centres LEONI Studer (Switzerland) and LEONI Kerpen (Germany) are linked by one thing in particular: competence. In extensive production areas, we work with state-of-the-art methods and systems in plastics processing, materials processing, extrusion technology, electron beam cross-linking and the testing of all products.

We use state-of-the-art production equipment in order to offer our customers a maximum of safety and quality. New and innovative plastics mixtures and cables are constantly being developed in modern laboratories. The focus is on improved insulating properties, higher temperature tolerances, longer lifetimes, easy handling and better safety features. Our test laboratories for flammability tests, HF technology and optical measurement technology safeguard our quality standards and promote innovation.

This is demonstrated by the large number of approvals and certificates coming from well-known independent testing institutes worldwide.

Numerous national and international certificates confirm the company's ability to provide innovative solutions.

VDE



LPCB



Lloyd's Register

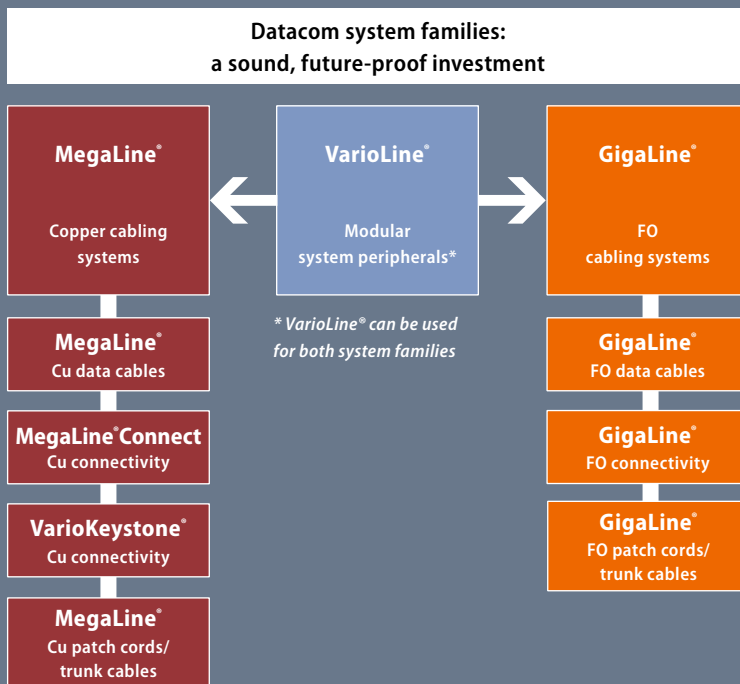


Underwriters Laboratories Inc.®



# Portfolio

Strong brands, strong service



LEONI organises its range of data communications products for the passive cabling infrastructure in buildings and local networks into three main groups:

- |                               |                   |
|-------------------------------|-------------------|
| ■ Copper cabling systems      | <b>MegaLine®</b>  |
| ■ Fiber optic cabling systems | <b>GigaLine®</b>  |
| ■ Modular system peripherals  | <b>VarioLine®</b> |

**MegaLine®** from LEONI is a copper system family for all classes and categories that delivers a sound, future-proof investment. It incorporates MegaLine® Copper data cables, patch cords and trunk cables as well as MegaLine® Connect and VarioKeystone® Connectivity.

**GigaLine®** allows extremely high bandwidths and long transmission distances thanks to its fiber optic technology. GigaLine® Fiber optic data cables, patch cords and trunk cables as well as GigaLine® Connectivity combine to produce an extremely efficient system.

**VarioLine®** is a modular consolidation point and underfloor range. All connection components can be easily and quickly integrated into different areas of application and adapted to local conditions.

LEONI also offers a comprehensive service package comprising data sheets, announcement texts, seminars and certification programmes.



# VarioLine® CP – consolidation point range

for copper and fiber optic connectivity

**The consolidation point range is an efficient and cost-effective solution for designing highly flexible floor, DataCenter or industrial cabling systems.**

In office cabling (EN 50173-2), consolidation points (CPs) between floor distributors (FD) and telecommunication outlets (TO) offer extremely flexible solutions for rapidly changing office configurations.

The CP can be installed in raised floors, suspended ceilings, columns or ducts. From there, flexible cables (CP cables) lead to the data outlets at the workstation.

The CP cabling connects the permanent cabling with modular or mobile office systems such as partitions or office furniture into which the TO is already installed. In industrial cabling, a so-called intermediate distributor (ID) is used to connect the floor distributor (FD) with the telecommunication outlet (TO) which for example allows temporary machine cablings (EN 50173-3).

In DataCenters, CPs as local distribution points (LDP) can provide an additional patching option between a zone distributor (ZD) and equipment outlet (EO) (EN50173-5).

The robust VarioLine® consolidation points are made of galvanised steel panel and are available in several sizes.

There are different module panels available for VarioLine® CP housings:

- MegaLine® Connect100
- MegaLine® Connect45
- VarioKeystone®
- all common keystone modules
- GigaLine® LC Duplex
- GigaLine® SC Duplex

**If necessary, the product range can be expanded by using additional module panels for copper as well as fiber optic systems.**

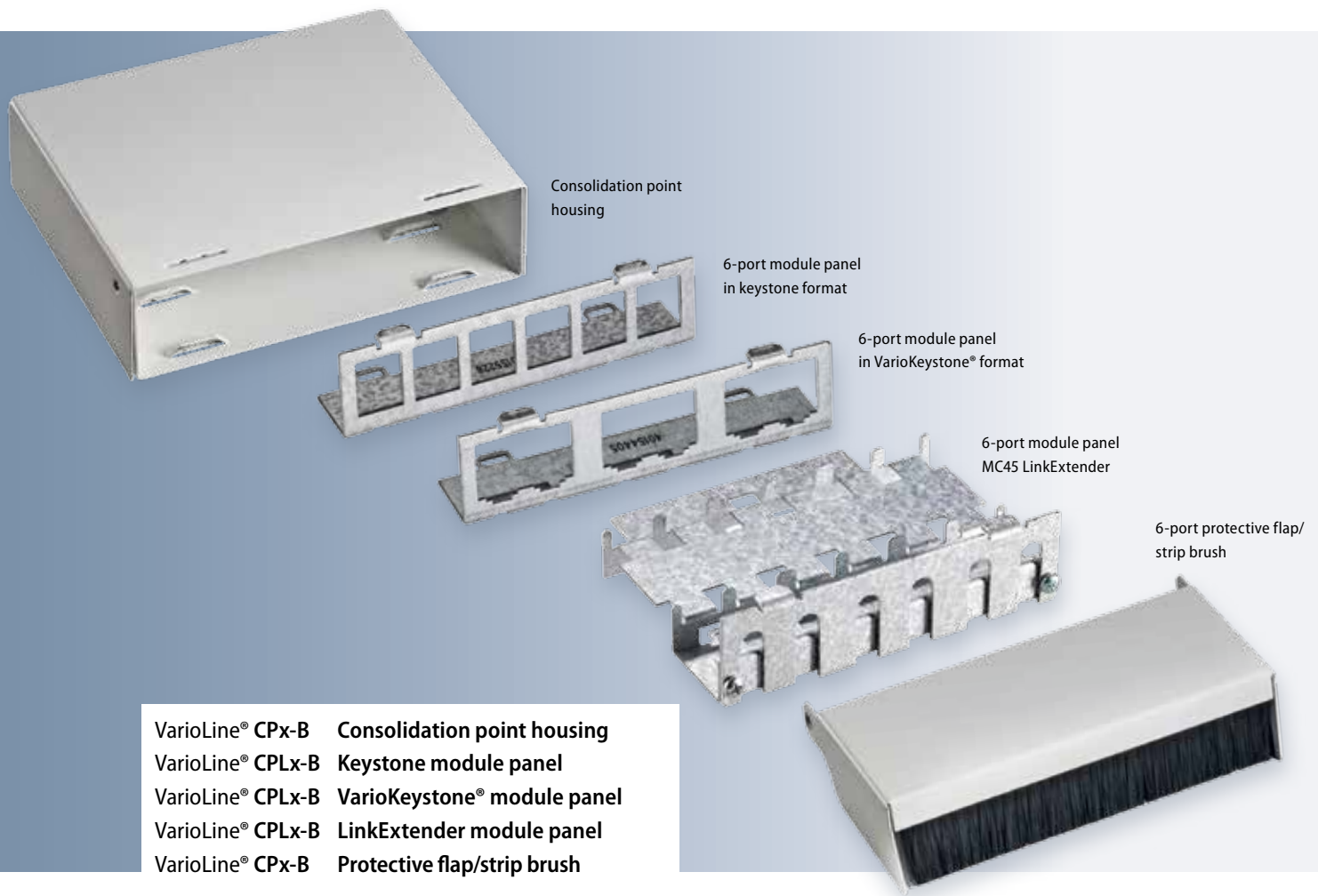
## Features of VarioLine® CP:

- The easy snap-in installation of the cover on the floor or zone distributor side makes troublesome screwing and the use of special tools unnecessary.
- The patch side is covered by a hinged cover with a strip brush.
- The incoming cables and the patch cords can be held by cable ties.
- The housings can be earthed if necessary.
- The CP cables pass through the raised floor via the necessary floor outlets which are installed in the base plate.
- VarioLine® CP floor outlets can be closed flush with the floor when they are not required and are set upright to pass cables through.
- The cover then also protects the cables as they come out.



# VarioLine® Consolidation point housing

with DIN rail clip



## Description

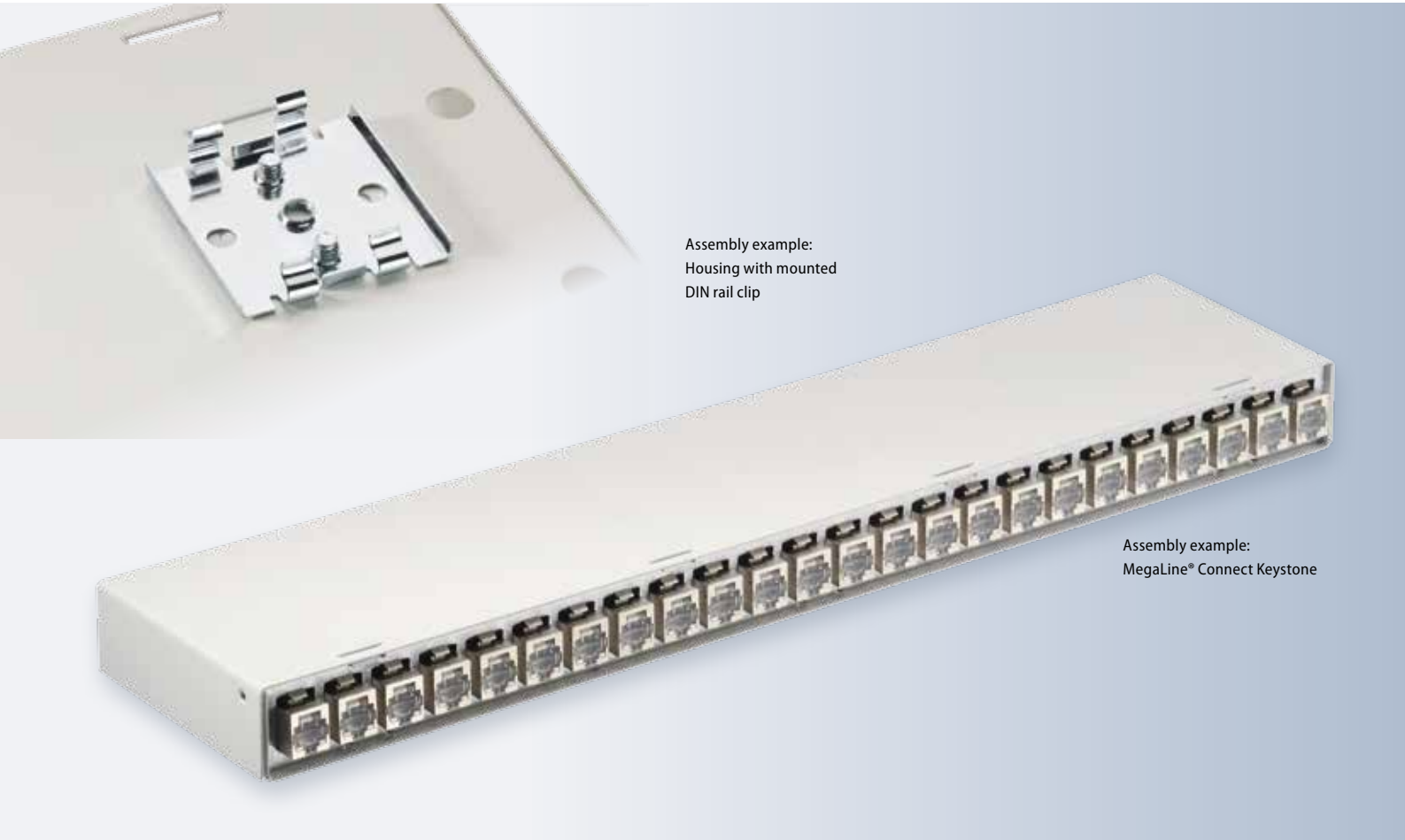
For installation in raised floors or suspended ceilings. CP housing with strain relief using cable ties (not included in the scope of delivery). Can be equipped with MegaLine® Connect45 or Vario-Keystone® modules.

A protective flap with strip brush can optionally be used on the patch side.

- Modular (interchangeable module panel)
- Also available with 6/ 12 or 24 ports as an option
- Robust housing made from galvanised steel panel
- Free of hazardous substances


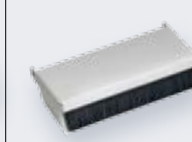


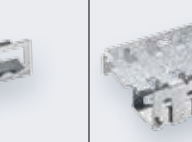
## Mounting

- The CP housing is attached using the DIN rail mounting technique (a suitable clip is included)
- The housing can alternatively be attached using screws or nailed dowels (not included in the scope of delivery)
- The module panel is attached by snapping it into the housing
- The modules are attached by snapping them into the module panel



Assembly example:  
Housing with mounted  
DIN rail clip

Assembly example:  
MegaLine® Connect Keystone

Consolidation point housing	Protective flap/ strip brush	Keystone for MegaLine® Connect45 (Keystone jacks)	VarioKeystone for MegaLine® Connect45 (VarioKeystone) and MegaLine® Connect100 jacks	LinkExtender for MegaLine® Connect45 LinkExtender
				
Order no.				
LKD 9ZE6 1007 0000	LKD 9ZE6 1008 0000	LKD 9ZE6 1064 0000	LKD 9ZE6 1014 0000	LKD 9ZE6 1092 0000
LKD 9ZE6 1074 0000	LKD 9ZE6 1073 0000	LKD 9ZE6 1067 0000	LKD 9ZE6 1017 0000	LKD 9ZE6 1093 0000
LKD 9ZE6 1075 0000	LKD 9ZE6 1076 0000	LKD 9ZE6 1068 0000	LKD 9ZE6 1018 0000	LKD 9ZE6 1094 0000

## VarioLine® Consolidation point housing

for 6, 12, 24-port module panels

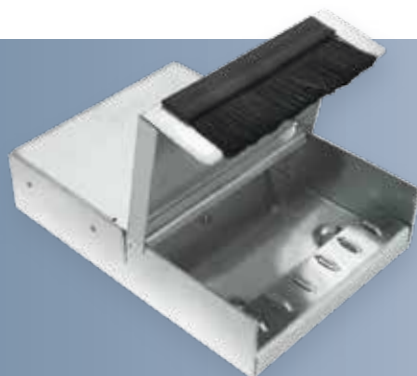


Fig. 1  
Consolidation point housing  
for 6-port module panel

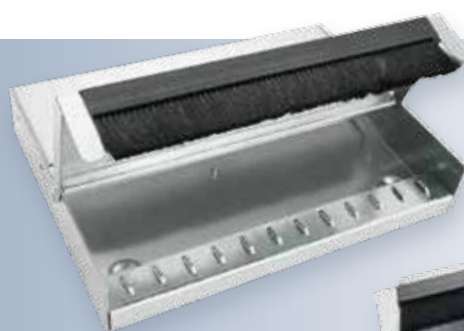


Fig. 2  
Consolidation point housing  
for 12-port module panel

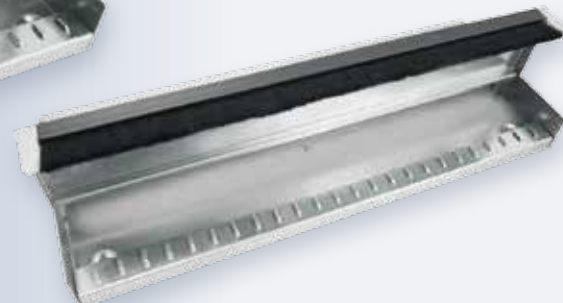


Fig. 3  
Consolidation point housing  
for 24-port module panel

### VarioLine® CP6 / CP12 / CP24

#### Description

For installation in raised floors or suspended ceilings, can be equipped with 6, 12 or 24-port module panels in different designs.

The module panel is installed by pushing it into place; can additionally be screwed.

- Bottom plate with hinged flap and dust protective brush on the patch side
- Cover can be removed/mounted on the tertiary cable side without the use of tools
- Potential equalisation possible (drilled hole diam. 5 mm)
- The housing can be attached using screws or nailed dowels (not included in the scope of delivery)

#### Housing

Housing	Galvanised sheet panel
Dimensions	<b>CP 6</b> 55 mm x 155 mm x 215 mm (HxWxD) <b>CP 12</b> 55 mm x 290 mm x 215 mm (HxWxD) <b>CP 24</b> 55 mm x 550 mm x 215 mm (HxWxD)

#### Accessories

see page 17/18

6, 12 or 24-port module panels

Fig.	Designation	Configuration	Order no.
1	VarioLine® CP6 Consolidation point housing (1 piece)	for 6-Port-Module panel	LKD 9ZE6 1001 0000
2	VarioLine® CP12 Consolidation point housing (1 piece)	for 12-Port-Module panel	LKD 9ZE6 1002 0000
3	VarioLine® CP24 Consolidation point housing (1 piece)	for 24-Port-Module panel	LKD 9ZE6 1003 0000

# VarioLine® Module panels with 6, 12, 24 ports

for consolidation points



VarioLine® CPL12 VK module  
12-port module panel  
can be equipped with  
MegaLine® Connect100 modules



VarioLine® CPL12 Keystone  
12-port module panel  
can be equipped with  
Keystone® modules

VarioLine® CPL6 VK module  
VarioLine® CPL12 VK module  
VarioLine® CPL24 VK module

VarioLine® CPL6 Keystone  
VarioLine® CPL12 Keystone  
VarioLine® CPL24 Keystone

## Description

Module panel made from galvanised steel panel for installation in corresponding CP housing.

The module panel is installed in the housing by pushing it into place; can additionally be screwed.

- Modules or cable plugs are attached by snapping them in
- Can be equipped with 6 / 12 / 24 modules depending on the version (see table)

Matching modules/ cable plugs	MegaLine® Connect100 RJ45	MegaLine® Connect100 4K7A	MegaLine® Connect100 8C7A	MegaLine® Connect 45 (VarioKeystone® format)	MegaLine® Connect 45 (Keystone)
Module panel CPL6 / CPL12 / CPL24 VK module for MegaLine® Connect100 module (compatible with VarioKeystone®)					
Module panel CPL6 / CPL12 / CPL24 Keystone for MegaLine® Connect45 module					

Designation	Order no.
VarioLine® CPL6 VK module*	LKD 9ZE6 1011 0000
VarioLine® CPL12 VK module*	LKD 9ZE6 1012 0000
VarioLine® CPL24 VK module*	LKD 9ZE6 1013 0000

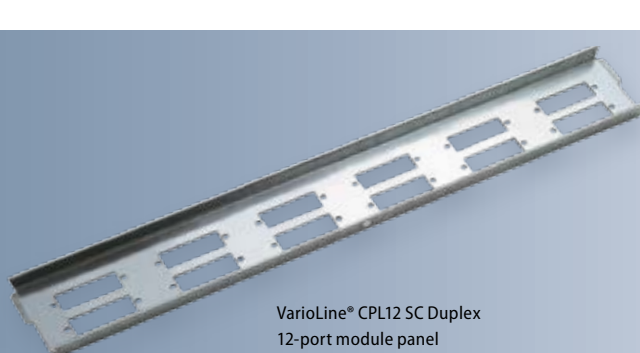
\* (1 piece)

Designation	Order no.
VarioLine® CPL6 Keystone*	LKD 9ZE6 1061 0000
VarioLine® CPL12 Keystone*	LKD 9ZE6 1062 0000
VarioLine® CPL24 Keystone*	LKD 9ZE6 1063 0000

\* (1 piece)

## VarioLine® Module panels with 6-, 12-, 24 ports

for consolidation points



VarioLine® CPL12 SC Duplex  
12-port module panel  
can be equipped with  
GigaLine® SC Duplex couplings



VarioLine® CPL12 LC Duplex  
12-port module panel  
can be equipped with  
GigaLine® LC Duplex couplings

VarioLine® CPL6 SC Duplex  
VarioLine® CPL12 SC Duplex  
VarioLine® CPL24 SC Duplex

VarioLine® CPL6 LC Duplex  
VarioLine® CPL12 LC Duplex  
VarioLine® CPL24 LC Duplex

### Description

Module panel made from galvanised steel panel for installation in corresponding CP housing.

The module panel is installed in the housing by pushing it into place; can additionally be screwed.

- Modules are attached by screwing or snapping them in (with CPL keystone module panel)
- Can be equipped with 6 / 12 / 24 modules depending on the version (see table)

### Assembled module panels

Assembled CPL SC Duplex and CPL LC Duplex module panels are available on request.

Matching couplings	GigaLine® SC Duplex	GigaLine® SC Duplex/ST	GigaLine® SC-Simplex	GigaLine® LC Duplex	GigaLine® E-2000
Module panel CPL6 / CPL12 / CPL24 SC Duplex for GigaLine® couplings					
Module panel CPL6 / CPL12 / CPL24 LC Duplex for GigaLine® couplings					

Designation	Order no.
VarioLine® CPL6 SC Duplex	LKD 9ZE6 1041 0000
VarioLine® CPL12 SC Duplex	LKD 9ZE6 1042 0000
VarioLine® CPL24 SC Duplex	LKD 9ZE6 1043 0000

Designation	Order no.
VarioLine® CPL6 LC Duplex	LKD 9ZE6 1051 0000
VarioLine® CPL12 LC Duplex	LKD 9ZE6 1052 0000
VarioLine® CPL24 LC Duplex	LKD 9ZE6 1053 0000

# VarioLine® Floor outlet

round / rectangular



VarioLine® CPB1 Floor outlet rectangular

## Description

For installation in raised floors.

Attached by screwing into the base plate (screws not included in the scope of delivery).

- Rotatable
- Three positions possible
  1. Closed flush with the floor
  2. Open
  3. Open, flush with the floor with strip brush
- Free of hazardous substances

## Housing

Housing	Brushed stainless steel
Dimensions	80 mm x 160 mm x 63 mm (HxWxD)



VarioLine® CPB1 Floor outlet round

## Description

For installation in raised floors.

Attached by screwing into the base plate (screws not included in the scope of delivery).

- Square frame, round cover
- Two positions possible
  1. Closed flush with the floor
  2. Open
- Free of hazardous substances

## Housing

Housing	Brushed stainless steel
Dimensions	
Open	60 mm x 140 mm x 140 mm (HxWxD)
Closed	47 mm x 140 mm x 140 mm (HxWxD)

Designation	Order no.
VarioLine® CPB1 floor outlet rectangular (1 piece)	LKD 9ZE6 1010 0000

Designation	Order no.
VarioLine® CPB2 floor outlet round (1 piece)	LKD 9ZE6 1020 0000



## VarioLine® DC – DataCenter range

for holding DClint modules

The most notable characteristic of the DataCenter range is that rather than just meeting the current standards and requirements for DataCenters, it actually exceeds them. The quick and easy installation ensures uninterrupted DataCenter operation.

The "true" plug and play solution for copper and fiber optic applications consists of a VarioLine® DClint frame (19", 1 RU) for holding MegaLine® DClint and GigaLine® DClint modules. The DClint modules are simply inserted and audibly clicked into place from the rear after the links are installed.



Advantages at a glance:

- "True" plug and play solution
- Minimal attenuation
- Maximum reliability
- Factory-tested

### Modules



### Accessories



VarioLine® DClint frame, 19"

### Frame

# VarioLine® DClink frame 19" / 1 RU

for holding up to 3 DClink modules



Fig. 1  
DClink frame 19" / 1 RU



Fig. 2  
DClink dummy cover

## VarioLine® DClink frame 19" / 1 RU

### VarioLine® DClink dummy cover

**Description**

For quick, easy and reliable installation of pre-assembled DClink modules in DataCenters.  
Unused module openings are closed off with the dummy cover.

- Can be equipped with GigaLine® and / or MegaLine® DClink modules
- For holding up to 3 modules

**Housing**

Housing	Powder-coated steel panel
Colour	Jet black RAL 9005

**Dimensions**

19" / 1 RU	44 mm x 483 mm x 175 mm (HxWxD)
------------	---------------------------------

**Accessories (optional)**

Dummy cover	For closing off a module opening 42 mm x 133 mm x 39 mm (HxWxD)
-------------	--

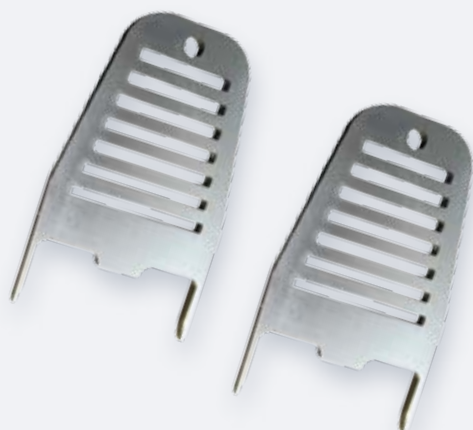
**Matching modules / segments**

GigaLine® DClink 40/100	GigaLine® DClink	GigaLine® DC MTP module	MegaLine® DC MC45 module	MegaLine® DC VK module	GigaLine® DClink dummy cover

Fig.	Designation	Configuration	Order no.
1	VarioLine® DClink frame 19" / 1 RU (8 pieces)	GigaLine® DClink modules	LKD 9R00 0005 0000
2	VarioLine® DClink dummy cover (8 pieces)		LKD 9R00 0006 0000

# VarioLine® DataCenter accessories & cable management panel 19" / 1 RU

for DCLink



VarioLine® DCLink release tool

## Description

For easy removal of the DCLink modules from the DCLink frame.

## Construction

Material	Stainless steel
Dimensionsen	65 mm x 40 mm x 4 mm (HxWxD)

Fig. 1  
VarioLine® DC CMP1  
with 82 mm metal clips

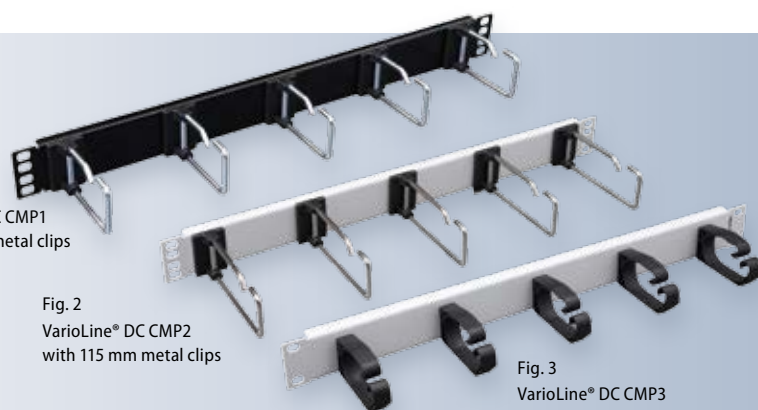


Fig. 2  
VarioLine® DC CMP2  
with 115 mm metal clips

Fig. 3  
VarioLine® DC CMP3  
with 78 mm plastic clips

VarioLine® DC CMP1 with metal clips	82 mm
VarioLine® DC CMP2 with metal clips	115 mm
VarioLine® DC CMP3 with plastic clips	78 mm

## Description

For reliable installation of fiber optic and copper patch cords in the distribution cabinet. With metal or plastic clips depending on the model.

## Construction

Panel	Powder-coated steel panel
Colours	Light grey RAL 9005 / Jet black RAL 9005

## Dimensions

DC CMP1	44 mm x 483 mm x 95 mm (HxWxD)
DC CMP2	44 mm x 483 mm x 127 mm (HxWxD)
DC CMP3	44 mm x 483 mm x 90 mm (HxWxD)

Designation	Order no.
VarioLine® DCLink release tool (1 pair)	LKD 9R00 0002 0000

Fig.	Designation	Colour	Order no.
1	VarioLine® DC CMP1 with 82 mm metal clips (1 piece)	Jet black RAL 9005	LKD 9ZE3 0050 0000
–	VarioLine® DC CMP1 with 82 mm metal clips (1 piece)		LKD 9ZE1 0006 0000
2	VarioLine® DC CMP2 with 115 mm metal clips (1 piece)	Light grey RAL 7035	LKD 9A61 0028 0000
3	VarioLine® DC CMP3 with 78 mm plastic clips (1 piece)		LKD 9A61 0020 0000



## VarioLine® UF – underfloor systems

Mounting plate solution – modular and universal

The "VarioLine® UF" underfloor systems (floorbox solutions) offer an efficient and cost-effective solution for terminating copper and fiber optic systems.

They offer a high degree of flexibility in the office environment. Desks can be connected to the power and IT network without the usual jumble of cables. The modular and universal mounting plate solutions are available for all common underfloor systems (e.g. Ackermann or Electraplan).

The mounting plate replaces the equipment rack, offering maximum space for the cable feed. The tilted feed-in and feed-out guarantees secure cable routing, even with very low raised floors.

Adapter plates allow cost-effective and efficient installation of all LEONI connectivity components, whether copper or fiber optic.



Example of an underfloor solution from LEONI in an Ackermann floorbox

# VarioLine® UF – underfloor systems / floorbox solutions

## System overview

**MegaLine® Connect100**  
4K7A



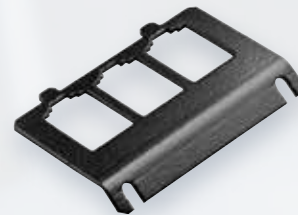
**MegaLine® Connect100**  
8C7A



**MegaLine® Connect100**  
RJ45

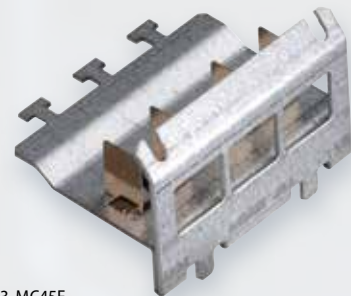


**MegaLine® Connect45**  
(in VarioKeystone® format)



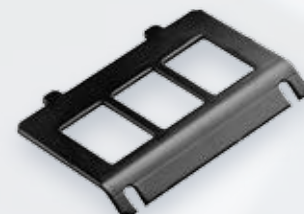
**VarioLine® UF AP3-VK**  
for up to 3 MegaLine® Connect100 modules or  
for up to 3 MegaLine® Connect45 modules  
(in VarioKeystone® format)

**MegaLine® Connect45**  
(in ELine format)



**VarioLine® UF AP3-MC45E**  
for up to 3 MegaLine® Connect45 modules  
(in ELine format)


**MegaLine® Connect45**  
(in Keystone format)




**VarioLine® UF AP3-MC45K**  
for up to 3 MegaLine® Connect45 modules  
(in Keystone format)

**Jack**


**Adapter plate**




**VarioLine® UF TA2**  
for Ackermann  
GES 2, 4, 6, R4, R7



**VarioLine® UF TA3**  
for Ackermann  
GES 9, R7, R9



**VarioLine® UF TEK3**  
for Electraplan KDR series  
(old type)



**VarioLine® UF TEV3**  
for Electraplan  
VQ12, VR12, VR10

## Mounting plate

# VarioLine® UF – underfloor systems / floorbox solutions

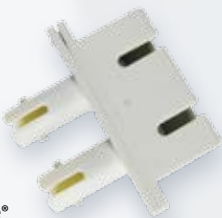
System overview

based on GigaLine® couplings

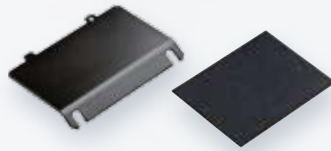
GigaLine®  
SC Duplex



GigaLine®  
SC Duplex/ST



Dummy cover  
for VarioLine® UF mounting plates



VarioLine®  
UF AP4-SCD  
for up to 4 couplings



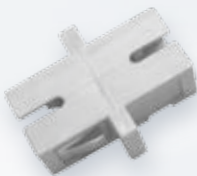
VarioLine® UF TA2  
for Ackermann  
GES 2, 4, 6, R4, R7



VarioLine® UF TA3  
for Ackermann  
GES 9, R7, R9



GigaLine®  
SC-Simplex



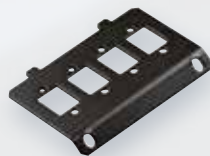
GigaLine®  
LC Duplex



GigaLine®  
E-2000



VarioLine®  
UF AP4-LCD  
for up to 4 couplings



VarioLine® UF TEK3  
for Electraplan KDR series  
(old type)



VarioLine® UF TEV3  
for Electraplan  
VQ12, VR12, VR10

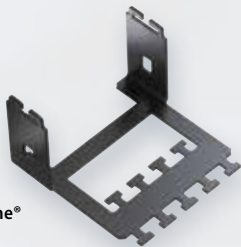


Jacks

Adapter plate

Adapter plate

VarioLine®  
UF K1



VarioLine®  
UF K2



VarioLine® UF O2  
for mounting plates T2



VarioLine® UF-SC2  
for excess-length module UM2



VarioLine® UF O3  
for mounting plates T3



VarioLine® UF-SC3  
for excess-length module UM3



Strain relief

Excess-length module with splice tray (optional)

# VarioLine® Mounting plates for underfloor systems

for installing wall outlets



Fig. 1  
Mounting plate VarioLine® UF TOA2-2  
for Ackermann GES 2, 4, 6, R4, R7

Fig. 2  
Mounting plate VarioLine® UF TOA3-2  
for Ackermann GES 9, R7, R9



Fig. 3  
Mounting plate VarioLine® UF TOA3-3  
for Ackermann GES 9, R7, R9

## VarioLine® UF TOA2-2 / UF TOA3-2

### Description

**UF TOA2-2** → for mounting up to 2 wall outlets with 50 mm x 50 mm central plate and lateral attachment or one wall outlet with circumferential ring.

**UF TOA3-2** → for mounting up to 2 wall outlets with 50 mm x 50 mm central plate and lateral attachment or two wall outlets with circumferential ring.

- For installation in Ackermann device inserts

### Housing

Mounting plate	Powder-coated steel panel, 1.5 mm
Colour	Jet black, RAL 9005

## VarioLine® UF TOA3-3

### Description

For mounting up to 3 wall outlets with 50 mm x 50 mm central plate and lateral fastening or two wall outlets with circumferential ring.

- For installation in Ackermann device inserts

### Housing

Mounting plate	Powder-coated steel panel, 1.5 mm
Colour	Jet black, RAL 9005

Fig.	Designation	Order no.
1	VarioLine® UF TOA2-2 (1 piece)	LKD 9ZE6 0014 0000
2	VarioLine® UF TOA3-2 (1 piece)	LKD 9ZE6 0012 0000

Fig.	Designation	Order no.
3	VarioLine® UF TOA3-3 (1 piece)	LKD 9ZE6 0013 0000

# VarioLine® Mounting plates for underfloor systems

for installing adapter panels



Fig. 1  
Mounting plate VarioLine® UF TA2  
for Ackermann  
GES 2, 4, 6, R4, R7

Fig. 2  
Mounting plate VarioLine® UF TA3  
for Ackermann  
GES 9, R7, R9



Fig. 1  
Mounting plate VarioLine® UF TEK3  
for Electraplan KDR series  
(old type)

Fig. 2  
Mounting plate VarioLine® UF TEV3  
for Electraplan  
VQ12, VR12, VR10

## VarioLine® UF TA2 / UF TA3

### Description

For mounting up to 2 or 3 adapter plates.

- For installation in Ackermann device inserts

### Compatibility

UF TA2	Ackermann GES 2, 4, 6, R4, R7
UF TA3	Ackermann GES 9, R7, R9

### Housing

Mounting plate	Powder-coated steel panel, 1.5 mm
Colour	Jet black, RAL 9005

### Accessories (optional)

see page 36

Cable retainer for VarioLine® UF K1 / VarioLine® UF K2  
Adjustable cable strain relief for up to 9 individual cables

## VarioLine® UF TEK3 / UF TEV3

### Description

For mounting up to 3 adapter plates.

- For installation in Electraplan device inserts

### Compatibility

UF TEK3	Electraplan KDR series (old type)
UF TEV3	Electraplan VQ12, VR12, VR10

### Housing

Mounting plate	Powder-coated steel panel, 1.5 mm
Colour	Jet black, RAL 9005

### Accessories (optional)

see page 36

Cable retainer for VarioLine® UF K1 / VarioLine® UF K2  
Adjustable cable strain relief for up to 9 individual cables

Fig.	Designation	Order no.
1	VarioLine® UF TA2 (1 piece)	LKD 9ZE6 0001 0000
2	VarioLine® UF TA3 (1 piece)	LKD 9ZE6 0002 0000

Fig.	Designation	Order no.
1	VarioLine® UF TEK3 (1 piece)	LKD 9ZE6 0008 0000
2	VarioLine® UF TEV3 (1 piece)	LKD 9ZE6 0042 0000

# VarioLine® Adapter panels for underfloor systems

for installation in VarioLine® UF mounting plates

Fig. 1

Adapter panel VarioLine® UF AP3 VK  
for up to 3 MegaLine® Connect100 modules  
or for up to 3 MegaLine® Connect45 modules  
(VarioKeystone)

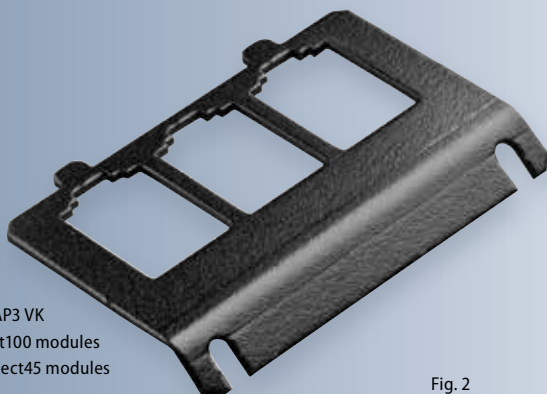
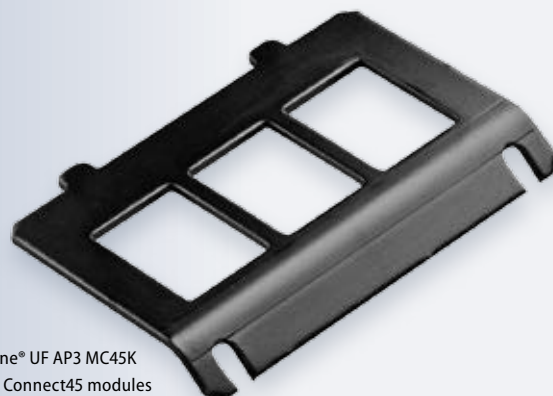


Fig. 2

Adapter panel VarioLine® UF AP3 MC45K  
for up to 3 MegaLine® Connect45 modules  
(Keystone)



VarioLine® UF AP3    VK  
VarioLine® UF AP3    MC45

## Description

Adapter panel for installation in VarioLine® UF mounting plates.  
For installing up to 3 modules.

- With self-adhesive labels for personal labelling
- 2 nut-and-washer assemblies included

## Compatibility

UF AP3 VK	→ for up to 3 MegaLine® Connect100 modules or for up to 3 MegaLine® Connect45 modules (VarioKeystone®)
UF AP3 MC45K	→ for up to 3 MegaLine® Connect45 modules (Keystone)

## Construction

Adapter panel	Steel panel, 1.5 mm
Surface	Zn – black, conductive

Matching jacks	MegaLine® Connect100 4K7A	MegaLine® Connect100 8C7A	MegaLine® Connect100 RJ45	MegaLine® Connect45 (VarioKeystone)	MegaLine® Connect45 (Keystone)
VarioLine® UF AP3 VK (compatible with VarioKeystone)					
VarioLine® UF AP3 MC45K					

Fig.	Designation	Order no.
1	VarioLine® UF AP3 VK (1 piece)	LKD 9A46 0118 0000
2	VarioLine® UF AP3 MC45 (1 piece)	LKD 9ZE6 0044 0000



Fig. 1  
Adapter panel VarioLine® UF AP3-MC45E  
for up to 3 MC45 modules (in ELine format)



Fig. 2  
Adapter panel VarioLine® UF AP4-SCD  
for up to 4 SC Duplex couplings



Fig. 3  
Adapter panel VarioLine® UF AP4-LCD  
for up to 4 LC Duplex couplings

## VarioLine® UF AP3-MC45E

### Description

Adapter panel for installation in VarioLine® UF mounting plates.  
For installing up to 3 MC45 modules (in ELine format).

- With earth or ground connection
- With self-adhesive labels for personal labelling
- 2 nut-and-washer assemblies included

### Construction

Adapter panel	Steel panel, 1.5 mm
Surface	Aluminium zinc

## VarioLine® UF AP4-SCD / UF AP4-LCD

### Description

Adapter panel for installation in VarioLine® UF mounting plates.  
For installing up to 4 SC or LC Duplex couplings.

- With self-adhesive labels for personal labelling
- 2 nut-and-washer assemblies included

### Compatibility

UF AP4-SCD	For up to 4 SC Duplex or SC Duplex/ ST couplings
UF AP4-LCD	For up to 4 LC Duplex, SC Simplex or E-2000 couplings

### Construction

Adapter panel	Steel panel, 1.5 mm
Surface	Zn – black, conductive

Matching jacks	MegaLine® Connect45 (im ELine format)	GigaLine® SC Duplex	GigaLine® SC Duplex/ST	GigaLine® SC-Simplex	GigaLine® LC Duplex	GigaLine® E-2000
VarioLine® UF AP3-MC45E						
VarioLine® UF AP4-SCD						
VarioLine® UF AP4-LCD						

Fig.	Designation	Order no.
1	VarioLine® UF AP3-MC45E (1 piece)	LKD 9ZE6 0106 0000

Fig.	Designation	Order no.
2	VarioLine® UF AP4-SCD (1 piece)	LKD 9FZZ 0078 0000
3	VarioLine® UF AP4-LCD (1 piece)	LKD 9FZZ 0079 0000

## VarioLine® Excess-length module

for underfloor systems



Fig. 1  
Excess-length module  
for mounting plates T2

Fig. 2  
Excess-length module  
for mounting plates T3

VarioLine® UF O2  
VarioLine® UF O3

### Description

Excess-length module for mounting on VarioLine®UF mounting plates. Can be mounted without the use of tools.

### Compatibility / Dimensions (available in two sizes)

UF O2	for mounting plates T2 61 mm x 75 mm x 135 mm (HxWxD)
UF O3	for mounting plates T3 61 mm x 75 mm x 176 mm (HxWxD)

### Housing

Excess-length module	Powder-coated steel panel, 1.5 mm
Colour	Jet black, RAL 9005

### Accessories (optional)

see page 36

A cable retainer is required for mounting the excess-length module

Fig.	Designation	Order no.
1	VarioLine® UF O2 (1 piece)	LKD 9FZZ 0080 0000
2	VarioLine® UF O3 (1 piece)	LKD 9FZZ 0018 0000

## VarioLine® Splice tray

for underfloor systems



Fig. 3  
Splice tray  
for excess-length module UM2

Fig. 4  
Splice tray  
for excess-length module UM3

VarioLine® UF SC2  
VarioLine® UF SC3

### Description

Splice tray with cover and splice holder for 12 crimp splices. For mounting on the underside of the corresponding excess-length module.

### Compatibility / Dimensions (available in two sizes)

UF SC2	for excess-length module UM2 10 mm x 75 mm x 113 mm (HxWxD)
UF SC3	for excess-length module UM3 10 mm x 75 mm x 154 mm (HxWxD)

### Housing

Splice tray	Powder-coated steel panel, 1.5 mm
Colour	Jet black, RAL 9005

Fig.	Designation	Order no.
3	VarioLine® UF SC2 (1 piece)	LKD 9FZZ 0020 0000
4	VarioLine® UF SC3 (1 piece)	LKD 9FZZ 0081 0000

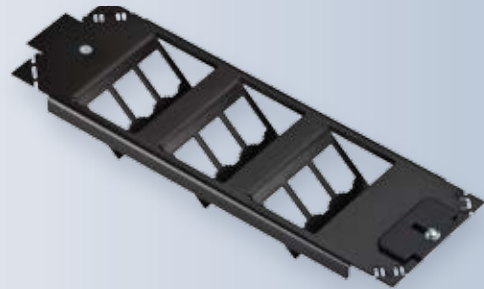
# VarioLine® Mounting plates for underfloor systems

for installing adapter panels



Fig. 1  
mounting plate VarioLine® UF TA2 3VK  
for Ackermann  
GES 2, 4, 6, R4, R7

Fig. 2  
mounting plate VarioLine® UF TA3 3VK  
for Ackermann  
GES 9, R7, R9



mounting plate VarioLine® UF TEV3 3VK  
for Electraplan  
VQ12, VR12, VR10

## VarioLine® UF TA2 3VK / UF TA3 3VK

### Description

Mounting plate with up to 2 or 3 integrated adapter plates.

- For installation in Ackermann device inserts

### Compatibility

UF TA2 3VK	Ackermann GES 2, 4, 6, R4, R7
UF TA3 3VK	Ackermann GES 9, R7, R9

### Housing

Mounting plate	Powder-coated steel panel, 1.5 mm
Colour	Jet black, RAL 9005

### Accessories (optional) see page 36

Cable retainer for VarioLine® UF K1 / VarioLine® UF K2  
Adjustable cable strain relief for up to 9 individual cables

## VarioLine® UF TEK3 3VK / UF TEV3 3VK

### Description

Mounting plate with up to 3 integrated adapter plates.

- For installation in Electraplan device inserts

### Compatibility

UF TEK3 3VK	Electraplan KDR series (old type)
UF TEV3 3VK	Electraplan VQ12, VR12, VR10

### Housing

Mounting plate	Powder-coated steel panel, 1.5 mm
Colour	Jet black, RAL 9005

### Accessories (optional) see page 36

Cable retainer for VarioLine® UF K1 / VarioLine® UF K2  
Adjustable cable strain relief for up to 9 individual cables

Matching jacks	MegaLine® Connect100 4K7A	MegaLine® Connect100 8C7A	MegaLine® Connect100 RJ45	MegaLine® Connect45 (VarioKeystone)
VarioLine® UF TA2 3VK / UF TA3 3VK				
VarioLine® UF TEK3 3VK / UF TEV3 3VK				

Fig.	Designation	Order no.
1	VarioLine® UF TA2 3VK (1 piece)	LKD 9ZE6 0046 0000
2	VarioLine® UF TA3 3VK (1 piece)	LKD 9ZE6 0045 0000

Fig.	Designation	Order no.
1	VarioLine® UF TEK3 3VK (1 piece)	LKD 9ZE6 0048 0000
2	VarioLine® UF TEV3 3VK (1 piece)	LKD 9ZE6 0047 0000

## VarioLine® Cable retainer

for underfloor systems

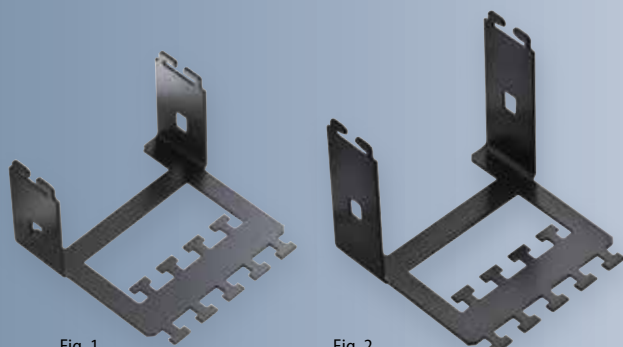


Fig. 1  
Cable retainer  
depth 45 mm

Fig. 2  
Cable retainer  
depth 64.5 mm

### VarioLine® UF K1

### VarioLine® UF K1

#### Description

Cable retainer for attachment to VarioLine® UF mounting plates.

#### Compatibility / Dimensions (available in two sizes)

UF K1	Depth 45 mm 61 mm x 72 mm x 45 mm (HxWxD)
UF K2	Depth 64.5 mm 61 mm x 72 mm x 64.5 mm (HxWxD)

#### Housing

Strain relief	Powder-coated steel panel, 1.5 mm
Colour	Jet black, RAL 9005

Fig.	Designation	Order no.
1	VarioLine® UF K1 (1 piece)	LKD 9ZE6 0003 0000
2	VarioLine® UF K2 (1 piece)	LKD 9ZE6 0004 0000

## VarioLine® Dummy cover

for VarioLine® UF mounting plates



Fig. 3  
Dummy cover  
UF mounting plates

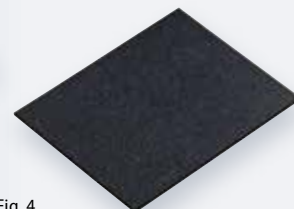


Fig. 4  
Dummy cover  
UF mounting plates  
for wall outlet inserts

### VarioLine® UF BP-T

### VarioLine® UF BP-TO

#### Description

Blind cover for closing off an unused opening in the VarioLine® UF mounting plate.

- 2 nut-and-washer assemblies included

#### Compatibility

UF BP-T	for VarioLine® UF mounting plates
UF BP-TO	for VarioLine® UF mounting plates for wall outlet inserts

#### Housing

Mounting plate	Powder-coated steel panel, 1.5 mm
Colour	Jet black, RAL 9005

Fig.	Designation	Order no.
3	VarioLine® UF BP-T (1 piece)	LKD 9ZE6 0005 0000
4	VarioLine® UF BP-TO (1 piece)	LKD 9ZE6 0015 0000



## Office Field of application



# Generic cabling in office buildings

The complete cable system, from distribution equipment to workstation

## Structure of a generic communication cable system ISO/IEC 11801 and DIN EN 50173-1/2

CD Campus distributor

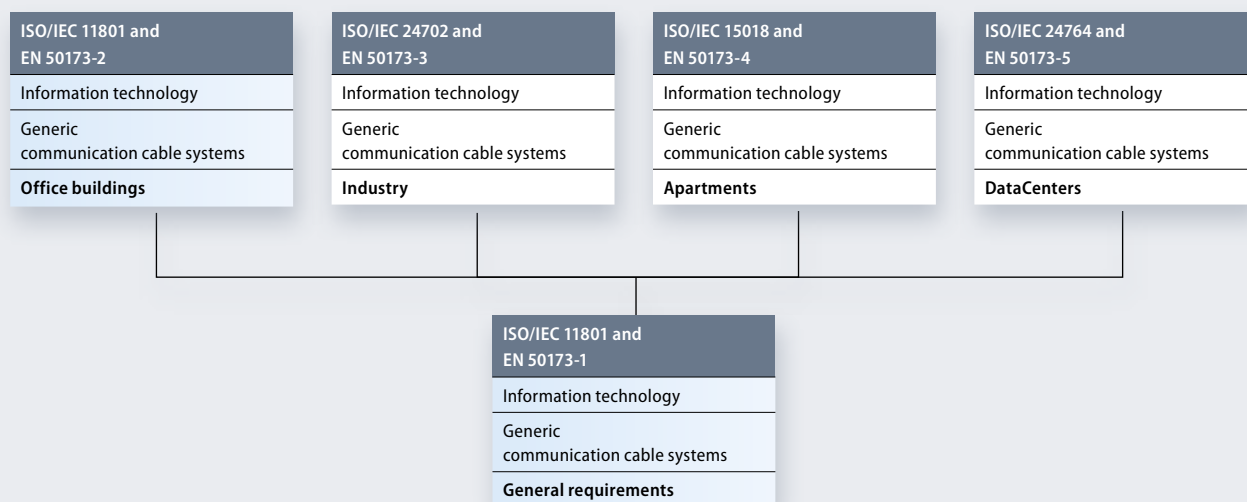
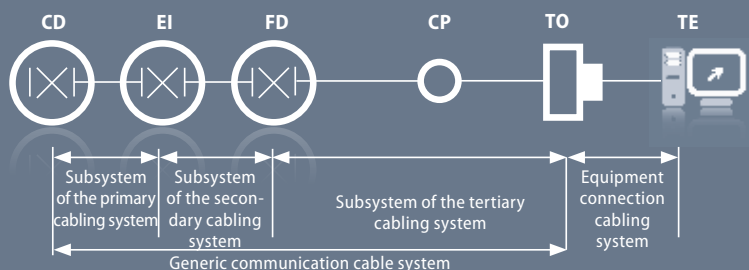
EI Building distributor

FD Floor distributor

CP Consolidation point

TO Telecommunications outlet

TE Terminal equipment



**These days, the future of a company depends to a large extent on reliable and timely data processing.**

The rapid development of data bit rates and the wide range of applications require a very flexible, high-performance network infrastructure that will be able to meet the demands for the next ten years.

High-quality generic IT networks form the backbone of the business in research & development, banks, insurance companies, universities, hospitals, hotels, airports and many other sectors, providing smooth operation and financial success.

The smart use of fiber optics and copper data technologies for the backbone and horizontal wiring to the user enables cost-effective networking of standard resources such as PCs and printers, with an extension to IP telephony and multimedia applications. Other applications, such as Power-over-Ethernet (PoE), support the powering of devices such as web cameras, wireless LAN access points, IP phones and laptops via the copper data cabling.

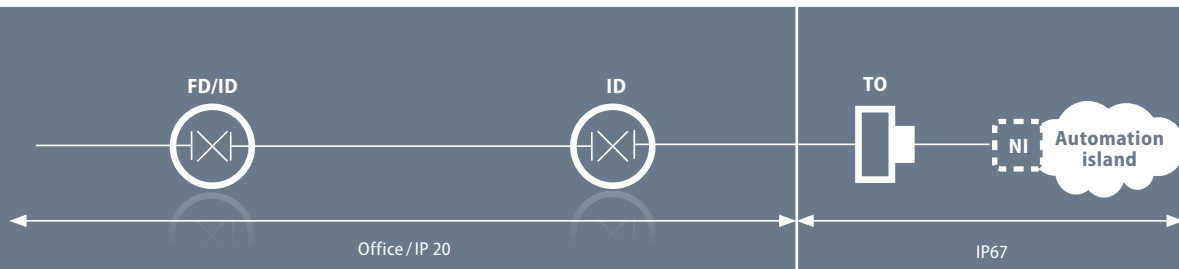
These structured, generic communication cable systems meet both the international and European standards set by ISO/IEC 11801 and DIN EN 50173-1/2 respectively.

# Industry

## Field of application

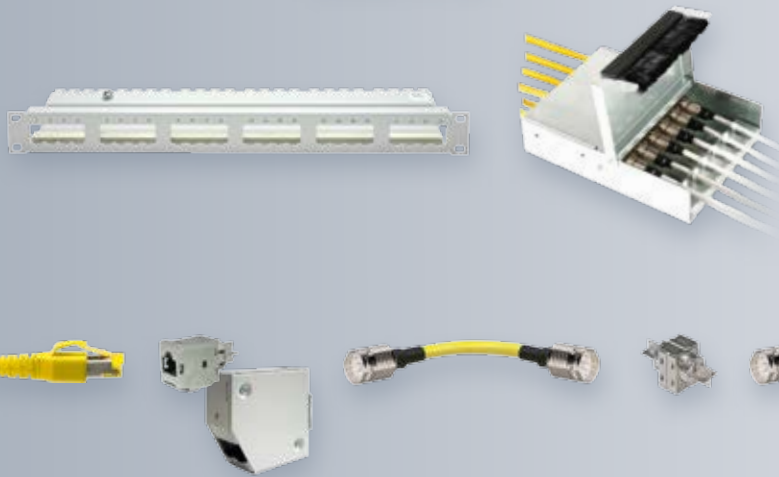


# Generic cabling in the industrial environment



Structure of a generic communication cable system  
in industrial facilities ISO/IEC 24702 and EN 50173-3

Office / IP 20



IP67



ISO/IEC 11801 and  
EN 50173-2

Information technology

Generic communication  
cable systems

Office buildings

ISO/IEC 24702 and  
EN 50173-3

Information technology

Generic communication  
cable systems

Industry

ISO/IEC 15018 and  
EN 50173-4

Information technology

Generic communication  
cable systems

Apartments

ISO/IEC 24764 and  
EN 50173-5

Information technology

Generic communication  
cable systems

DataCenters

ISO/IEC 11801 and  
EN 50173-1

Information technology

Generic communication  
cable systems

General requirements

# Industrial IT cabling

Uniform IT platforms are increasingly used to connect different worlds



**The worlds of office and industrial cabling are growing ever closer. The need for sales departments to receive current production data or to engage in short-term planning of production processes requires a uniform group-wide IT platform.**

Manufacturers of automation and control equipment demand consistent, future-proofed international standards, while users are looking for secure investments. Ever more applications in production processes are implemented via Ethernet, reducing maintenance and operating costs. Existing standards and applications, such as PROFINET, will still need support in the years to come.

This results in a requirement for a clear separation between "application" and "network", which can only be achieved using a uniform IT platform as a base, combined with generic communication cabling, in both the office and manufacturing environments. This requirement has been standardised in the EN 50173-1, -2, -3 series, and in the ISO/IEC11801 and ISO/IEC 24702 international standards.

A consistent extension of the use of generic cabling offers enormous advantages, including:

- Reduction in the assortment of products
- Deployment and distribution of mass-produced products
- Standardisation of acceptance measurements
- Reduction in training costs
- Easy trouble-shooting
- Simplification of the network operation, maintenance and documentation

It is frequently observed these days that the transmission requirements in industrial environments are less challenging than those in the office area. This can lead to a reduction in costs without risking the future requirements of the network. Since cable laying is expensive, and an expansion of technical requirements would lead to unnecessary additional costs, we recommend that data cables should be selected to meet the highest standards (Category 7 or above).

The connectivity can certainly be limited to the level currently required, if the equipment used can be adapted cleverly to meet changing requirements in both transmission rates and building or manufacturing construction.

**This balancing act is easily manageable using the VarioKeystone® connection system from LEONI.**

# MICE concept

Classification of environmental conditions



## MICE

	Requirement/level 1	Requirement/level 2	Requirement/level 3
M Mechanical	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>
I Ingress	I <sub>1</sub>	I <sub>2</sub>	I <sub>3</sub>
C Climatic/Chemical	C <sub>1</sub>	C <sub>2</sub>	C <sub>3</sub>
E Electromagnetic	E <sub>1</sub>	E <sub>2</sub>	E <sub>3</sub>

### The environmental factor

As well as the electrical or optical transmission channel, the different conditions in office and industrial settings mean that the environmental factor also plays an important role.

These environmental conditions are described using four basic characteristics:

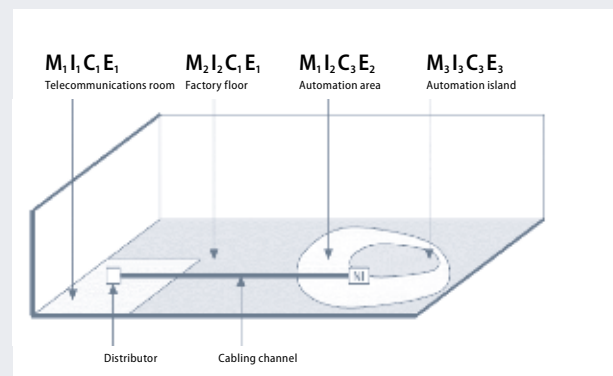
<b>Mechanical</b>	Mechanical properties
<b>Ingress</b>	Ingress properties
<b>Climatic/chemical</b>	Climatic and chemical properties
<b>Electromagnetic</b>	Electromagnetic properties

The four MICE criteria are broken down into different parameters, each with three levels. The higher the level, the more stringent the requirements:

- **Office environment** M<sub>1</sub> / I<sub>1</sub> / C<sub>1</sub> / E<sub>1</sub>
- **Factory environment (light duty)** M<sub>2</sub> / I<sub>2</sub> / C<sub>2</sub> / E<sub>2</sub>
- **Machine environment (heavy duty)** M<sub>3</sub> / I<sub>3</sub> / C<sub>3</sub> / E<sub>3</sub>

The MICE classification can vary over the length of the transmission link, for example mechanical loads in the office environment are fairly low and the ingress of liquids or significant climatic and chemical loads are equally unlikely. The conditions in buildings used for industrial purposes, on the other hand, are harsher:

Mechanical loads as well as the risk of ingress of dust, dirt and liquids; high, quickly changing temperatures; solar radiation and corrosive substances can affect the components. Electromagnetic interference also influences the data communication.



# Industrial IT cabling

VarioKeystone® connectivity



The VarioKeystone® system from LEONI Kerpen offers a flexible connection concept with an extremely secure future. The high-quality components allow transmission links exceeding the requirements of Class E to be established. The modular structure makes it possible to change the plug face from RJ45 to Tera with little effort if required. It is not necessary to reinstall the data outlets for this purpose.

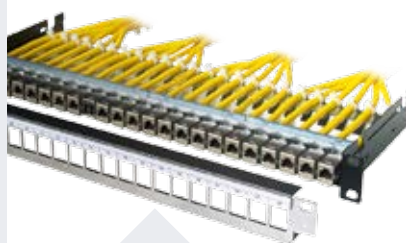
This makes choosing the required connectivity much easier and opens the door to a future with high data transmission rates. If new mating faces come onto the market in future, it will be possible to adapt to them. VarioKeystone® also offers the unique option of extending or changing a link – this is especially important in the case of cabling systems only designed for a few years of service, for example in the automotive industry.

The cable plugs are assembled on site using common tools; the only other thing that is required is a set of parallel press pliers. The jack modules can be pushed onto the cable plugs by hand and removed again if necessary using a simple release tool.

**LEONI offers the following for connections in the office environment:**

- Fixed and telescopic patch panels
- Wall outlets
- 2-port DIN rail housings
- A modular/universal consolidation point range "Varioline® CP" for 6, 12 and 24 channels

VarioKeystone® – One click takes you to the next generation



- Outstanding performance
- Just change the plug for a new interface
- Dispenses with the need to strip wires

Upward compatibility with VarioKeystone® technology

Cat. 7

Cat. 6<sub>A</sub>

Cat. 5/6



## Han® 3A industrial outlets

The best choice for use in harsh industrial environments



### Han® 3A industrial outlets

The Han® 3A metal outlet can be used for special mechanical loads, in which case the plug connection is held by a latching clip.

The watertightness of the class IP65/IP67 is also ensured with the matching industrial patch cords. As well as robustness and abrasion resistance, the construction and PUR sheath of the flexible cables used also offer exceptional chemical properties.

The certified industrial range is being extended for the first time with a high-quality cabling system whose primary characteristics are maximum future-proofing and unparalleled flexibility. No matter how adverse the ambient conditions (i.e. all MICE classes), it signals the end to problems with performance, breaker conditions and new mating faces.



Han® 3A industrial outlet  
RJ45 jack module, equipped

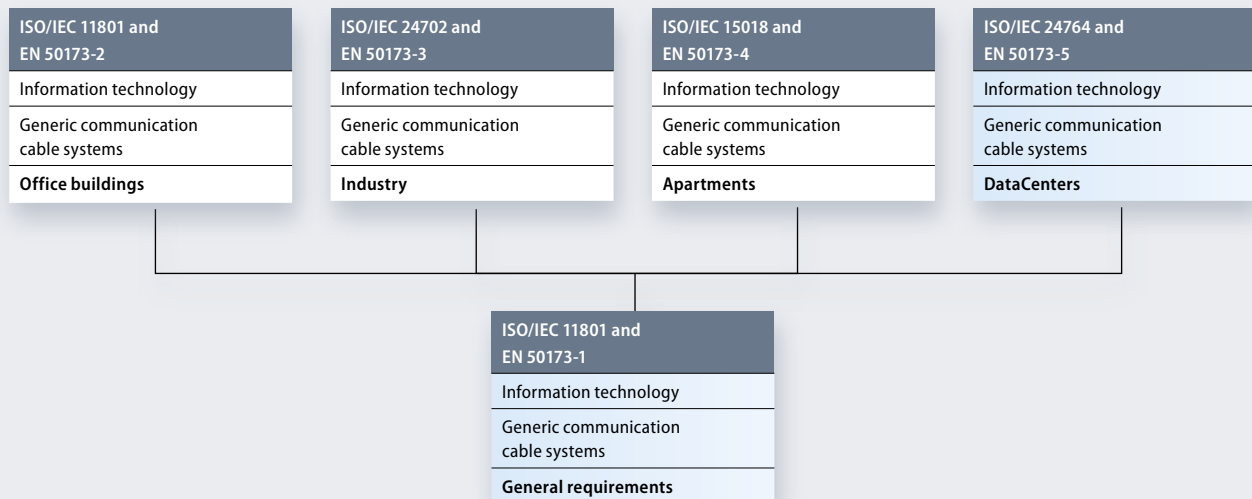
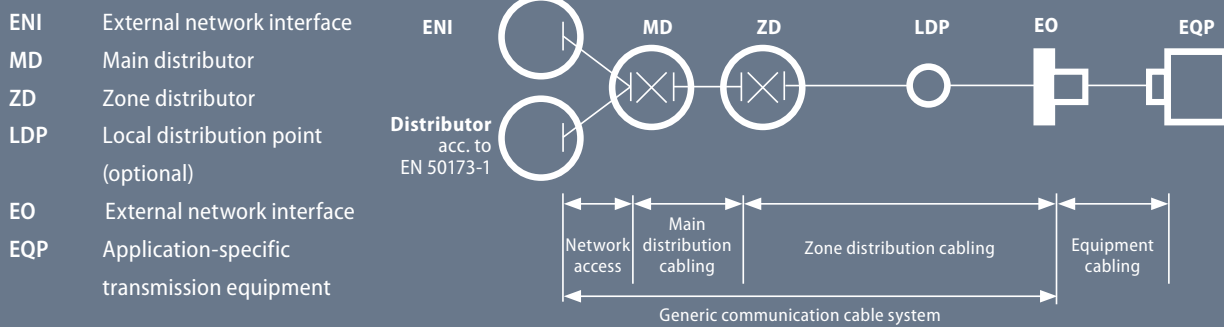
# DataCenter

## Field of application



# Generic cabling in DataCenters

## Structure of a generic communication cable system



### The structure

The maximum extension is 2,000 metres. In DataCenters the main distribution cabling is frequently designed using fiber optic technology, while in smaller networks the external network interface (ENI) is connected directly to the zone distributor (ZD). The standards describe various models for flexible and fixed connections in and between the subsystems.

The cabling of the main and zone distribution must, according to ISO/IEC 24764, meet the requirements of Class E<sub>A</sub> for copper technology and transmission classes OF-300, OF-500 and OF-2000 for fiber optic technology as a minimum.

### The standards

Generic communication cable systems are defined in the standards EN 50173-1 and ISO/IEC 11801.

In addition, specific requirements for DataCenters are defined in EN 50173-5 and ISO/IEC 24764.

The cabling used in DataCenters consists of three subsystems:

- Network access cabling
- Main distribution cabling
- Zone distribution cabling

# Requirements and solutions

Fast – high-quality – cost-optimised



## DataCenter

The DataCenter, the heart of the business, controls the production and administrative processes. A failure here can have catastrophic consequences, and the availability of a DataCenter must be therefore guaranteed more or less around the clock. The cabling system makes a key contribution to its operation reliability.

### Performance requirements for modern DataCenters

- Maximum availability, zero downtime → maximum reliability
- Short installation times
- Maximum performance
- Minimal space requirement – high packing density
- Cost efficiency
- Environmental compatibility – Green IT

The diverse requirements for DataCenters cannot be considered separately. For example, optimising the environmental performance will lead to a reduction in costs. Investing in industrially pre-assembled components is usually associated with higher costs, but enables installation and testing times to be reduced, thus reducing the cost associated with downtime.

### → High quality

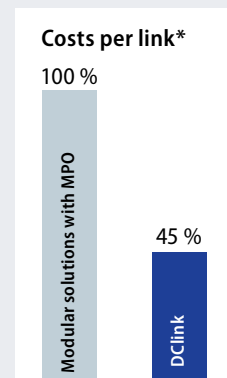
Quality testing at the factory, performance and safety are already built into LEONI products.

### → Minimise downtime

Installation and commissioning take a very short time, with no need for special tools or assembly skills. This keeps downtime to a minimum.

### → Cost reduction

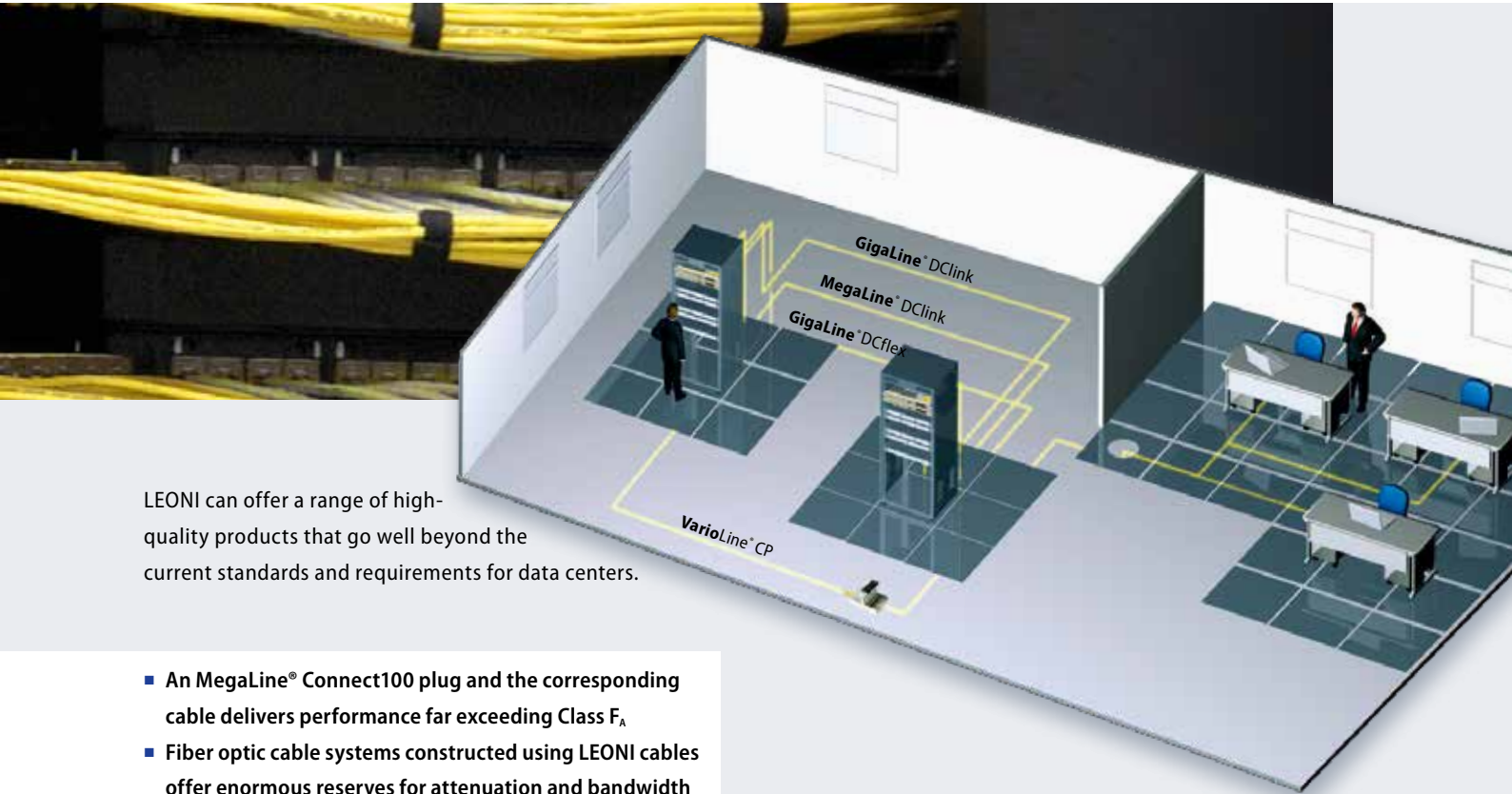
The use of GigaLine® DCLink results in cost savings of up to 55 % in comparison with traditional modular systems using MPO connection technology.



\* Example:  
Link length: 30 m,  
fibers: 24 x OS2,  
plugs: LC Duplex

# The advantages

Exceed all requirements with LEONI



LEONI can offer a range of high-quality products that go well beyond the current standards and requirements for data centers.

- An MegaLine® Connect100 plug and the corresponding cable delivers performance far exceeding Class F<sub>A</sub>
- Fiber optic cable systems constructed using LEONI cables offer enormous reserves for attenuation and bandwidth

## The Installation

Plug and play solutions for copper and fiber optic applications consist of pre-assembled links and the Varioline® DCLink frame (19", 1 RU) for the DCLink modules. The DCLink modules are simply inserted and clicked into place from the rear after the links are installed.

## DCLink system solutions

DCLink can be used to create fiber optic, copper or mixed configurations in various categories. This renders on-site assembly completely unnecessary. The modules can be easily removed again using a simple release tool.

## Ecologically aware cabling

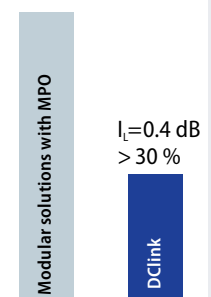
Environmentally sound materials and production methods, the possibility of recycling or ecologically viable recovery and, last but not least, the reusability of products if required guarantee maximum environmental compatibility. Cables and components are free of hazardous substances.

## Optimising attenuation

A GigaLine® DCLink offers up to 70 % less attenuation than conventional modular systems using MPO connectivity.

### Attenuation per link\*

$I_L = 1.4 \text{ dB}$   
100 %



\* Example:  
Link length: 30 m,  
fibers: 24 x OS2,  
plugs: LC Duplex

# Comparison of cabling systems

Single cable vs. multi cable



## Single cables –

### complex installation and cannot be reused

It is not just installing new cables that is difficult and time-consuming, but also removing the old cables. The only options are either to cut them out or simply leave them where they are. This means that there is no practical way of reusing them and they are not recycled.

The disorganised way in which the cables are installed obstructs the flow of cooling air. Only a higher volumetric flow rate and/or a lower air temperature can help here. Both mean higher costs and increased environmental impact.



## Multi cables –

### quick and clean installation and can be reused at any time

Pre-assembled multi cable solutions ensure a clean and clear cabling layout in the raised floor. As well as making installation easier and therefore quicker, this also helps to improve cooling air circulation.

Cables and components are free of hazardous substances.

The low volume of the installed multi cables guarantees an unobstructed flow of cooling air and therefore uses less energy.



## LEONI *news*

Additional catalogues for MegaLine® copper systems and GigaLine® fiber optic systems available online at [www.leoni-infrastructure-datacom.com](http://www.leoni-infrastructure-datacom.com).

Our regularly updated information services such as the LEONI newsletter keep you abreast of recent developments at LEONI and on the market.



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**LEONI Kerpen GmbH**

Zweifaller Strasse 275–287

52224 Stolberg

Germany

Phone +49 (0) 2402 17 1

Fax +49 (0) 2402 75154

E-Mail [infrastructure-datacom@leoni.com](mailto:infrastructure-datacom@leoni.com)

**LEONI Studer AG**

Herrenmattstrasse 20

4658 Däniken

Switzerland

Phone +41 (0)62 288 82 82

Fax +41 (0)62 288 83 83

E-Mail [infrastructure-datacom@leoni.com](mailto:infrastructure-datacom@leoni.com)