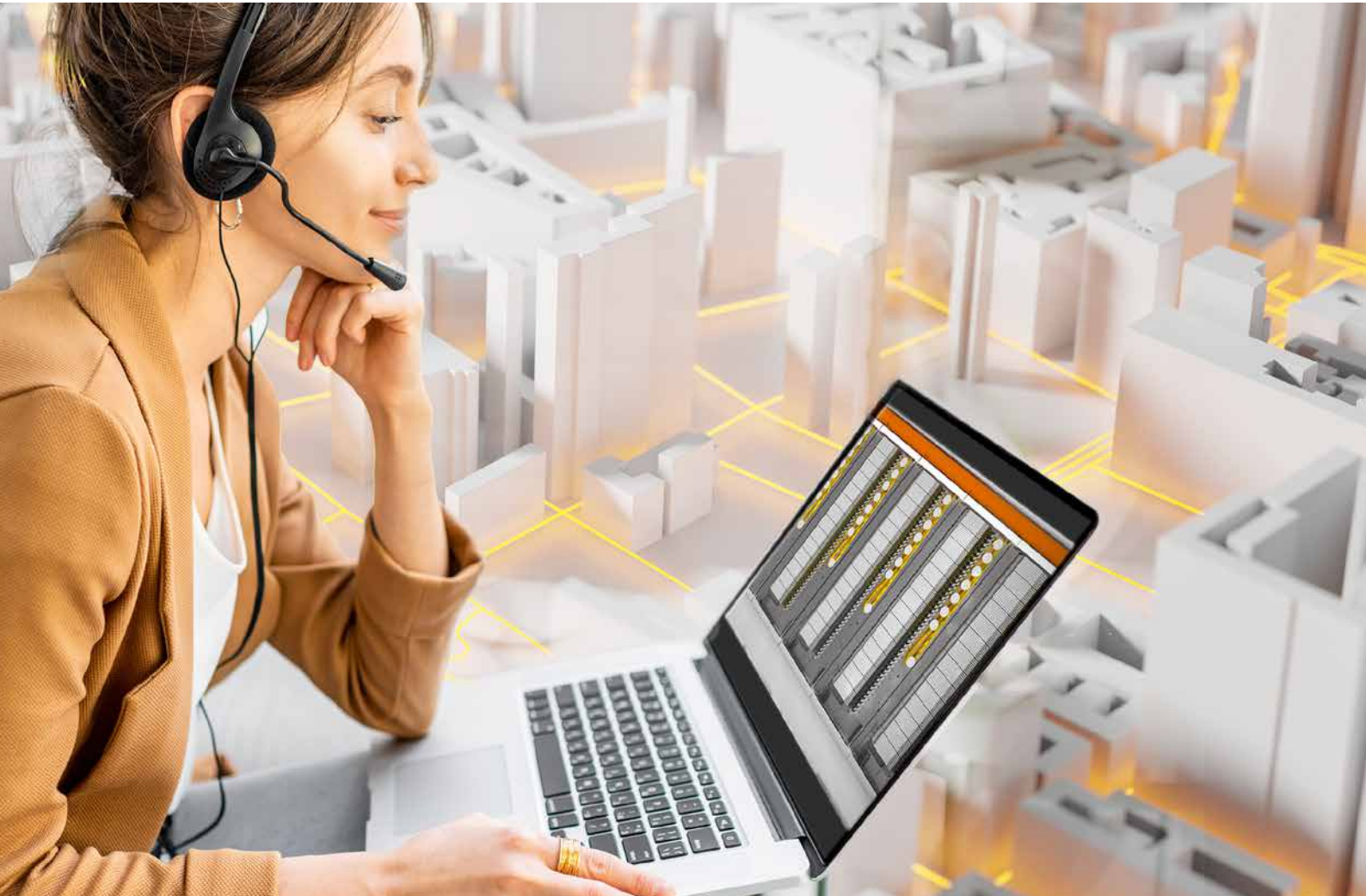


Always. Reliable. Connected.

hauff
technik | GRIDCOM



The **Solution Maker**
for your **network infrastructure**





hauff-technik | GRIDCOM

Hauff-Technik GRIDCOM is a joint venture of ZweiCom, founded in 2005, and the sealing specialist Hauff-Technik.

Thanks to its innovative strength and intelligent, high-quality solutions, the company has become the specialist for fibre to the home components.

As a supplier for the major telecommunications providers such as Deutsche Telekom, SwissCom, P&T Luxembourg, etc., we stand for high quality standards, optimised processes and reliable delivery performance.

Innovation, new ideas and a young, highly motivated team are the driving force behind this company.

At our site in Rosenberg, we develop and produce components for the passive fibre optic infrastructure from the central office to the house or flat. This includes ODF with splice/patch modules in high packing density and an intelligent patch cable management system.

We equip multifunctional housings and above-ground passive fibre optic network distributors for the FTTB/H expansion.

Our product portfolio also includes house termination points for single or multi-family homes, apartment blocks or industrial buildings. We can thereby cover all network levels of a fibre optic network infrastructure from a single source and thus assure the customer of unchanging quality and uniform consistency of the components on all network levels.



Our focus lies on time and cost savings in the expansion of FTTB/H networks.

The industrial prefabrication of our components, as well as pre-assembled complete solutions, ensure short installation times in the field, saving significant costs.

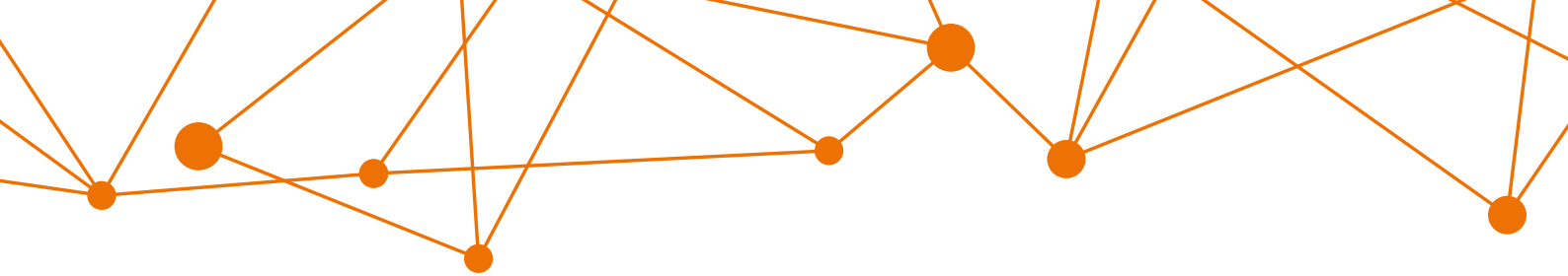
On request, we deliver our products ready for connection to the installation site, such as our turnkey PoP (Plug&Play) or the Mini-PoP as a "2LINE Whisper-PoP" with active cooling system.

Service is a top priority at Hauff-Technik GRIDCOM.

That is why you will always find a competent contact person in our in-house sales department and field service who will deal with your enquiries and offer you flexible solutions.

Get in touch with us, we are happy to be of service to you.





2LINE ODF

Optical Distribution Frame

The 2LINE ODF is the all-in-one solution for passive fibre optic network systems with a high fibre capacity and an easy-to-use patch cable management system.

Due to its modularity, it can be set up in a short time, as well as mirror-inverted for short patch paths. Completely pre-assembled cabinets according to customer requirements ensure considerable time savings on site.

The main areas of application for the ODF are Central Office -and Point of Presence (PoP) stations.

The 2LINE ODF can be equipped with depth-adjustable 19" or ETSI rails through modifications in the construction. In this way, active and passive technology can harmonise perfectly with each other and create a coherent and functioning overall system.

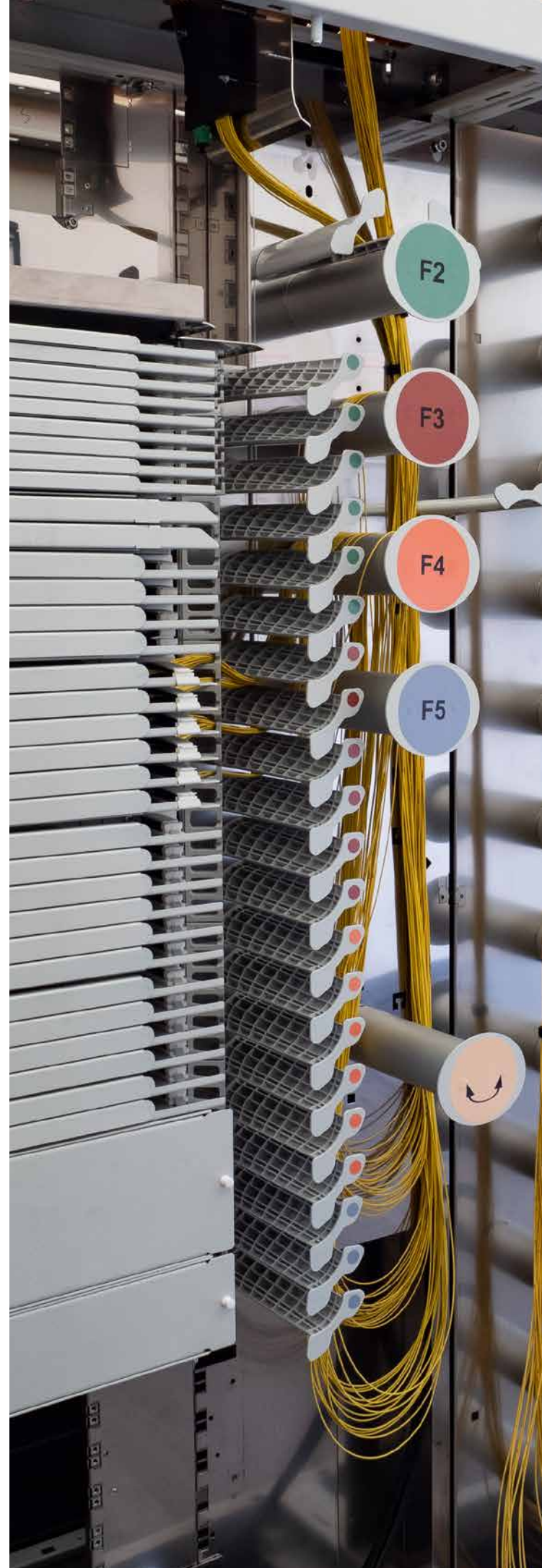
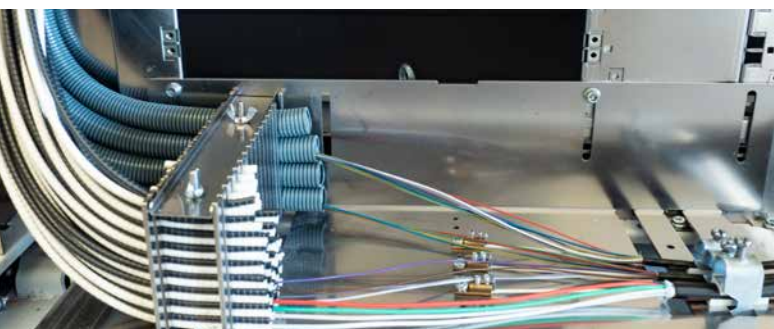


- Pre-assembled and ready for connection according to customer requirements
- Maximum packing density of 3,024 ports in 42U (14 x LC/dx HD 216 ports)
- Uniform patch cable length in the rack thanks to the 2LINE Patch⁺ matrix
- Versatile use due to easy modular construction



Functions

- Intelligent patch cable routing thanks to the 2LINE Patch⁺ matrix
- Cable entry from below or above
- Cable strain relief at the central element
- Cable fixation by means of clamp with counterpanel
- Fixation of the miniflex protective tubes for guiding of the bundle cores





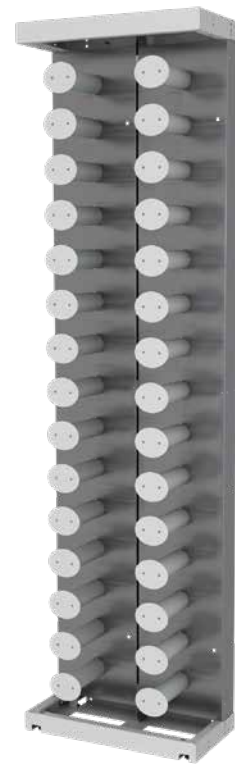
Options

- Up to 33U HxWxD[mm]: 1800x900x300
- Up to 42U HxWxD[mm]: 2200x900x300
- Depth-adjustable 19" rail set for the expansion of a combined rack with active technology
- Integration of splitter holders for a maximum of 88 splitters
- Doors with swivelling lever for lock cylinder
- Side panels for lateral closure
- Cover plate to protect the fibre bundles on the interceptor plate



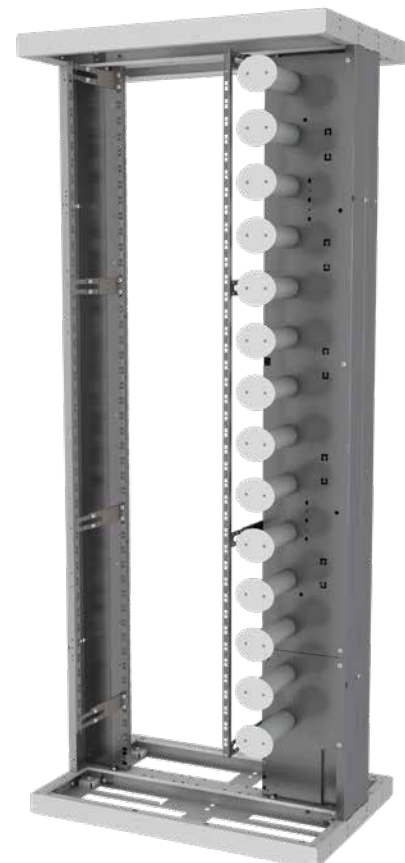
2LINE Patch+ matrix

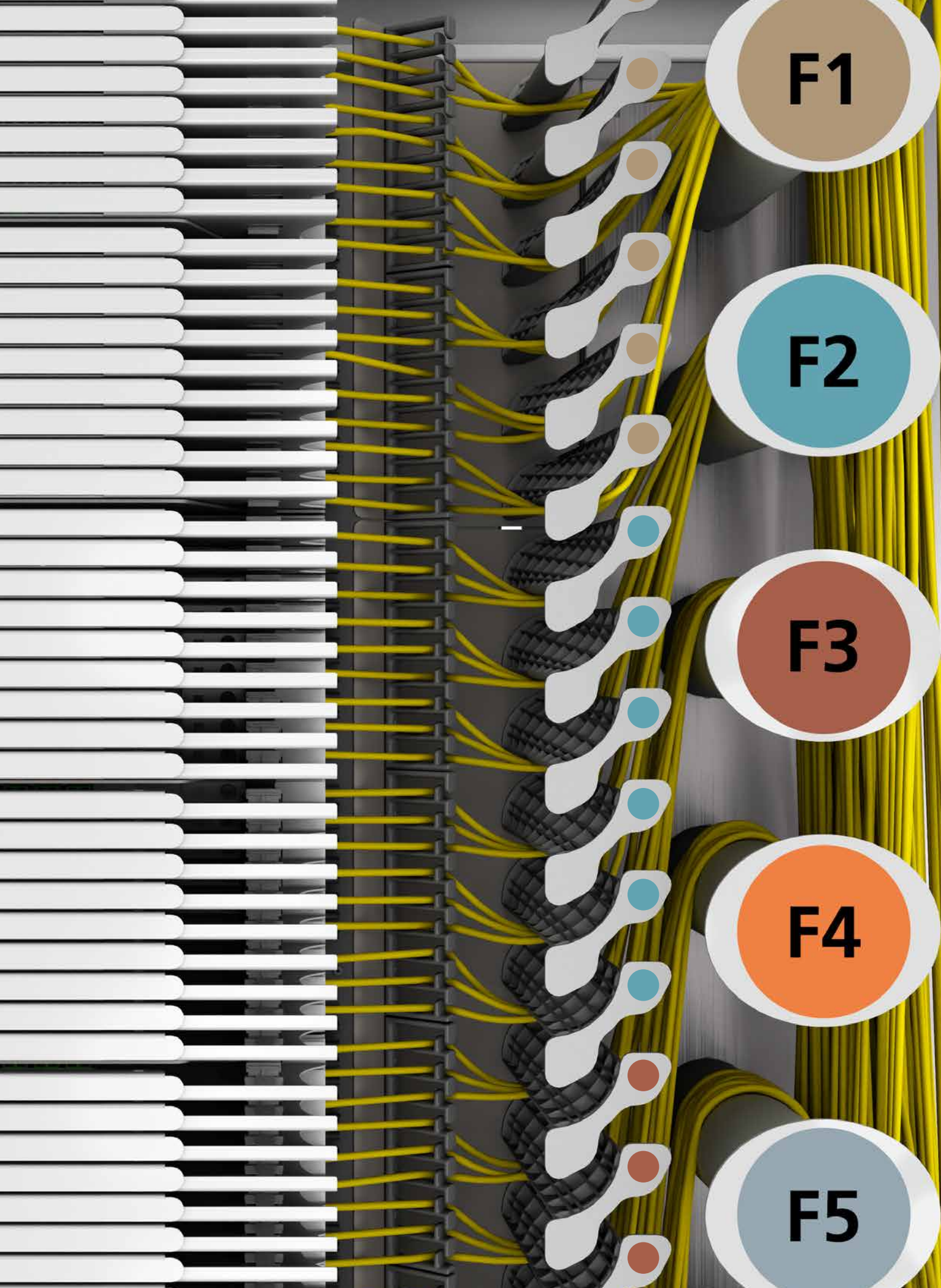
- Uniform patch cable lengths in the 2LINE ODF system
- Compliance with minimum bending radius
- Intelligent patch cable management for stress-free patch cable routing
- Marked patch cable routing
- Storage of excess patch cable lengths in the 2LINE POM



2LINE Rack for active technology

- Up to 33U HxWxD[mm]: 1800x900x600/300
- Up to 42U HxWxD[mm]: 2200x900x600/300
- Available for installation of 19" or ETSI technology
- Flexibility due to modular construction
- Integrated patch cable routing
- Doors with swivelling lever for locking cylinder, side panels for lateral closure
- Depth adapter up to 1000mm depth





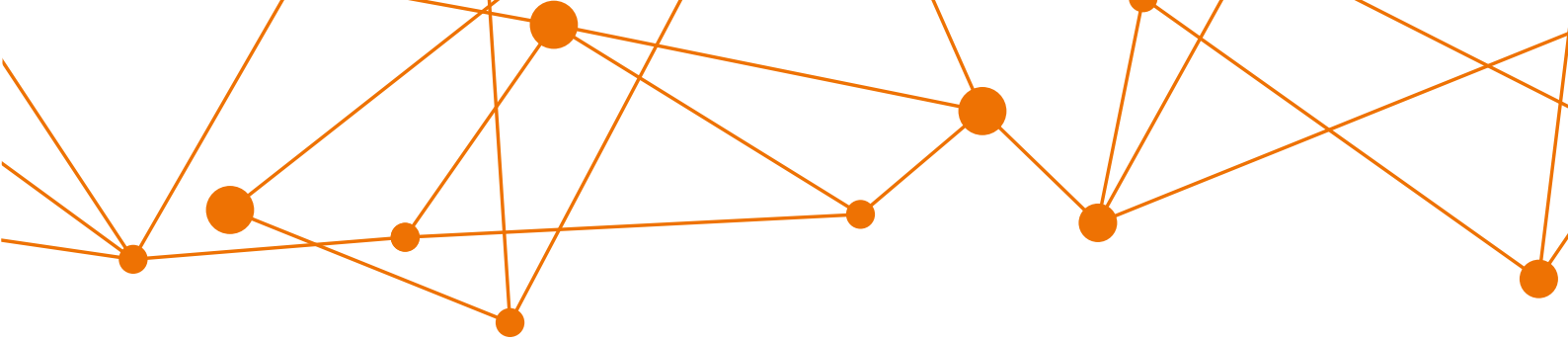
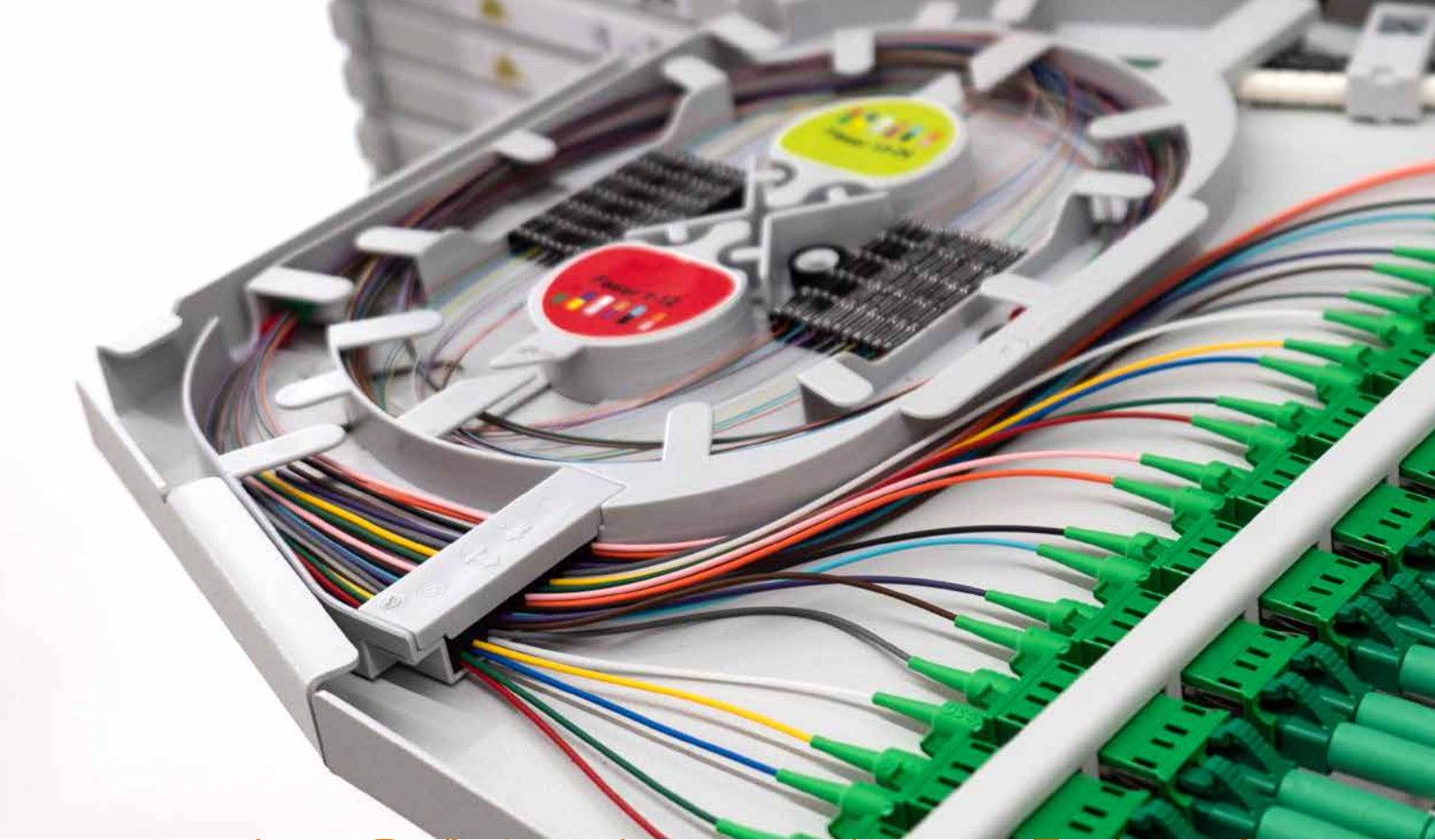
F1

F2

F3

F4

F5



2LINE SPM

Splice/Patch Modules

The 2LINE Splice/Patch Modules are compact connection and termination solutions for our passive fibre optic network components such as the 2LINE ODF or the 2LINE MFC.

With their high port capacity in the common connector types and fibre qualities, clear and easy-to-operate systems can be realised. Highest tested quality and a solid construction guarantee safety and durability. The modules are delivered completely pre-assembled for short assembly and splicing times.

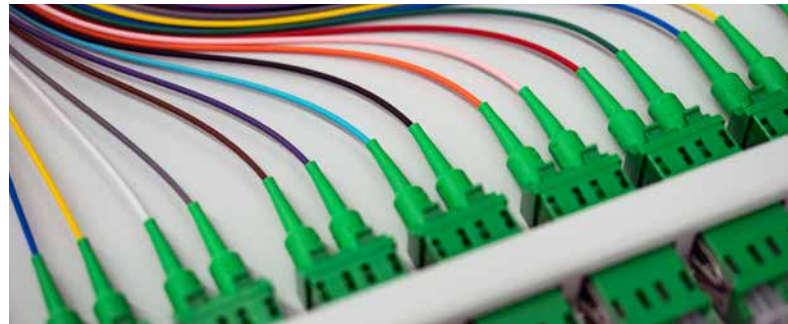
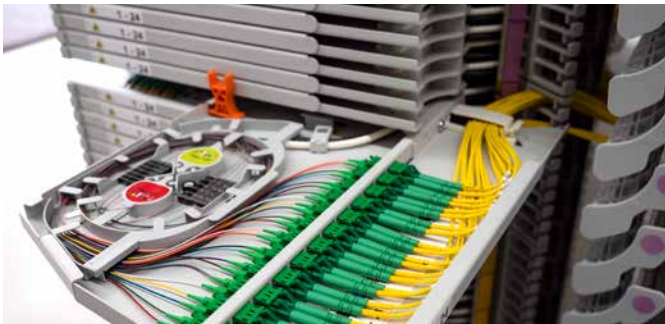
By feeding the fibre bundles via matching and reinforced

protective tubes, the fibres are guided according to the bending radius in the complete splice/patch module.

The modules are also available as mirrored versions.



- With pigtails, couplings and protective tubes pre-assembled, swivelling Splice/ Patch Modules
- High packing density of modules (3U with 216 LC ports)
- Foldable front panel as laser protection and for cleaning and measuring the pigtails
- Secured loose tube feed
- Patch cables and pigtail fibres are routed with optimum adherence to minimum bending radius
- Pigtails with LC-/ SC-/E2000 connectors or special requests possible



2LINE SPM ST – standard

- Modules pre-assembled with pigtailed and couplings in 1, 2 or 3U
- Drawer with 24 connectors each
 - 3U with 6 drawers
 - 2U with 4 drawers
 - 1U with 2 drawers
- Use of connectors: SC, LC and E2000
- Maximum ports for 2LINE ODF 220 (42U)
 - 2.016 LC, SC or E2000
- Maximum ports for 2LINE ODF 180 (33U)
 - 1.584 LC, SC or E2000
- Standard feed per drawer 2x miniflex protective tubes
- Availability of mirrored modules

3HE 2LINE SPM ST
144x SC/APC
144x LC/APC
144x E2000



2HE 2LINE SPM ST
96x SC/APC
96x LC/APC
96x E2000



1HE 2LINE SPM ST
48x SC/APC
48x LC/APC
48x E2000





2LINE SPM HD – high density

- Compressed modules with pigtails and couplings pre-assembled in 1, 2 or 3U
- Drawer with 24 connectors each
 - 3U with 9 drawers
 - 2U with 6 drawers
 - 1U with 3 drawers
- Use of connectors: LC
- Maximum ports for 2LINE ODF 220 (42U)
 - 3.024 LC
 - 2.592 LC recommended for optimum patch cable routing
- Maximum ports with 2LINE ODF 180 (33U)
 - 2.376 LC
- Standard feed per drawer 2x miniflex protective tubes
- Availability of mirrored modules

3HE 2LINE SPM HD
216x LC/APC



2HE 2LINE SPM HD
144x LC/APC

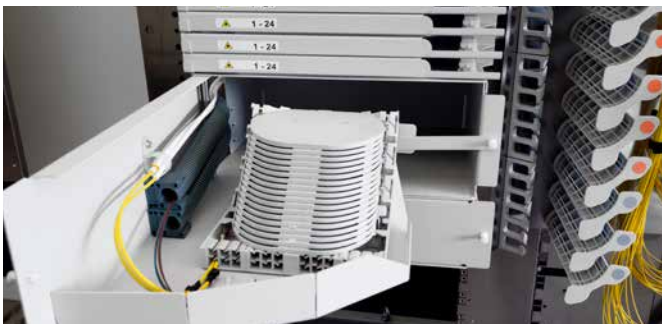


1HE 2LINE SPM HD
72x LC/APC



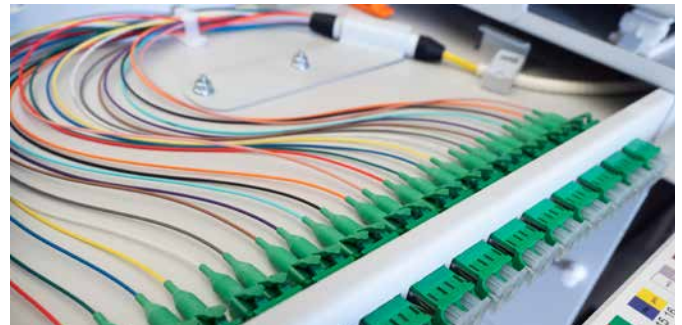
2LINE Splice Module – SM

- For splicing through fibres
- Module in 3U for a maximum of 216 splices
 - 18 cassette slots
 - Use of splice cassettes for crimp or shrink splice protection
- Module in 2U for a maximum of 144 splices
 - 12 cassette slots
 - Use of splice cassettes for crimp or shrink-splice protection
- Locking device when module is swung out
- Availability of mirrored module



2LINE Fanout-Modul – FM

- For individual connection of fibres of loose tubes or micro cables with pigtails
- Use in conjunction with 2LINE Splice Module SM
 - 1HE ST/HD 48/72 ports
 - 2HE ST/HD 96/144 ports
 - 3HE ST/HD 144/216 ports
- Hinged front panel as laser protection and for cleaning and and measuring the pigtails
- Module lock with clutch release
- Availability of mirrored module



2LINE Patch-Patch Modul – PPM

- 3U module with 9 drawers
- Supply and outlet of patch cables
- Drawers with 12x couplings each (SC or LC duplex)
 - Accommodates 2x 108 SC patch cables or
 - Accommodates 2x 216 LC patch cables
- Laser marking per module drawer
- Foldable front panel for laser protection and cleaning and measuring



2LINE – modul accessories

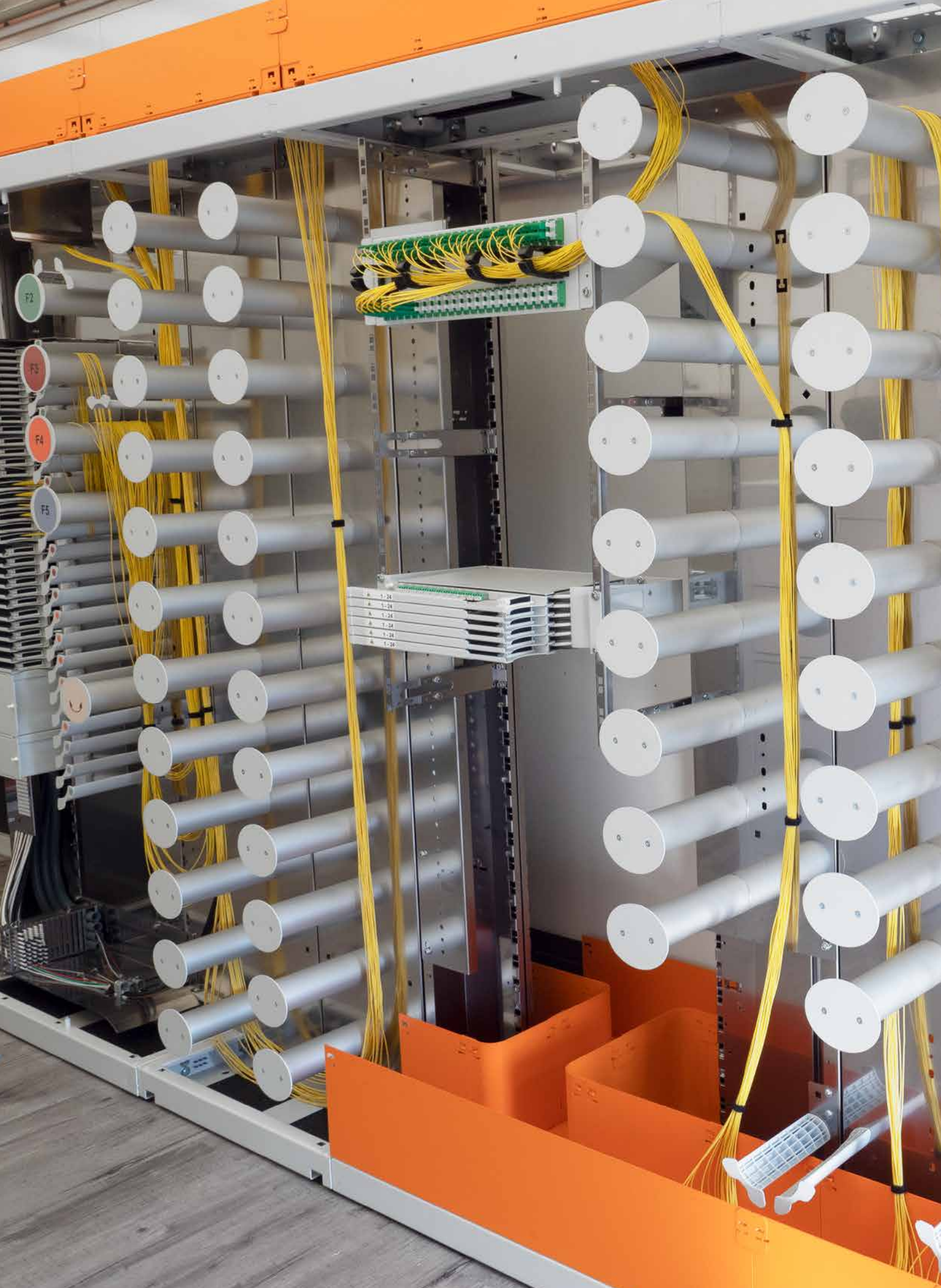
- Adapter for module installation in 19" or ETSI rack mounting on front side
 - 1HE – adapter
 - 2HE – adapter
 - 3HE – adapter
- Adapter for module installation in 19" or ETSI rack mounting on rear side
 - 1HE – adapter
 - 2HE – adapter
 - 3HE – adapter



2LINE ODF-Cable duct system – KKS at the top/bottom

- Flexible modular plug-in system
- Routing of the patch cables in compliance with the minimum bending radius
- Bending radius-protected 360° insertion element in the racks
- Assembly without special tools







2LINE PoP

Point of Presence

The 2LINE PoP-Station is a turnkey solution, which includes all the necessary parts for successful operating, such as air-conditioning, power supply, monitoring and the passive components.

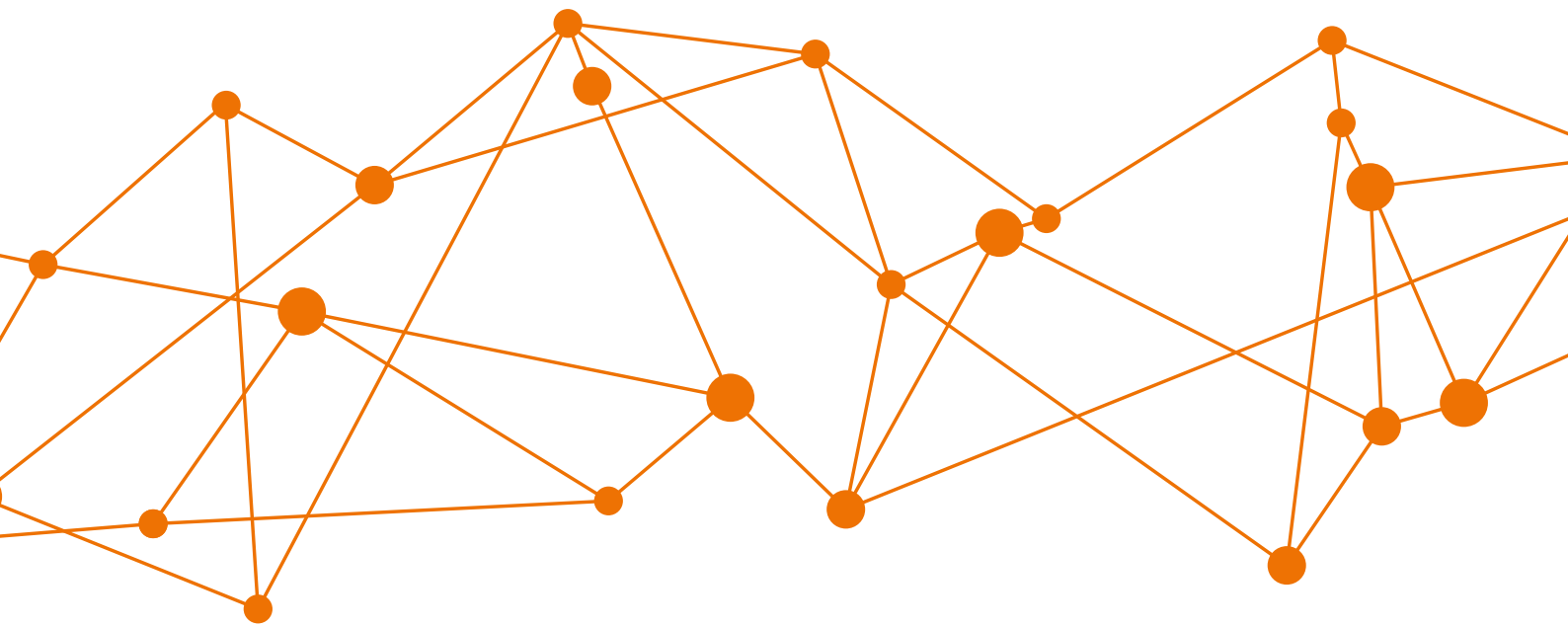
Turnkey Solution is applicable here in the truest sense of the word: a station is delivered that can be put into operation immediately after installation.

Predefined standards enable short delivery times and time savings in planning.





- Turnkey provision of the PoP-Station "all from a single source"
- Different PoP-Station sizes and variants
- Short delivery times
- Long service life with low operating costs
- Requirement-oriented expansion with the ODF system, racks for active technology and cable duct system



2LINE PoP-Station in cooperation with Betonbau

- Customised equipment with ODF racks, modules as well as racks for active technology
- Room air-conditioning according to requirements
- Power distribution and lighting as required
- Access protection and remote monitoring
- Earthing system
- UPS system
- Cable duct system
- Storage system for excess cable lengths
- Raised floor
- Individual cable/pipe penetrations



2LINE PoP-Station in cooperation with UTSolutions

- Customised equipment with ODF racks, modules as well as racks for active technology
- Room air-conditioning with free cooling
- Power distribution and lighting as required
- Access protection and remote monitoring
- Earthing system
- UPS system
- Cable duct system
- Storage system for excess cable lengths
- Raised floor
- Individual cable/pipe penetrations



UTSolutions

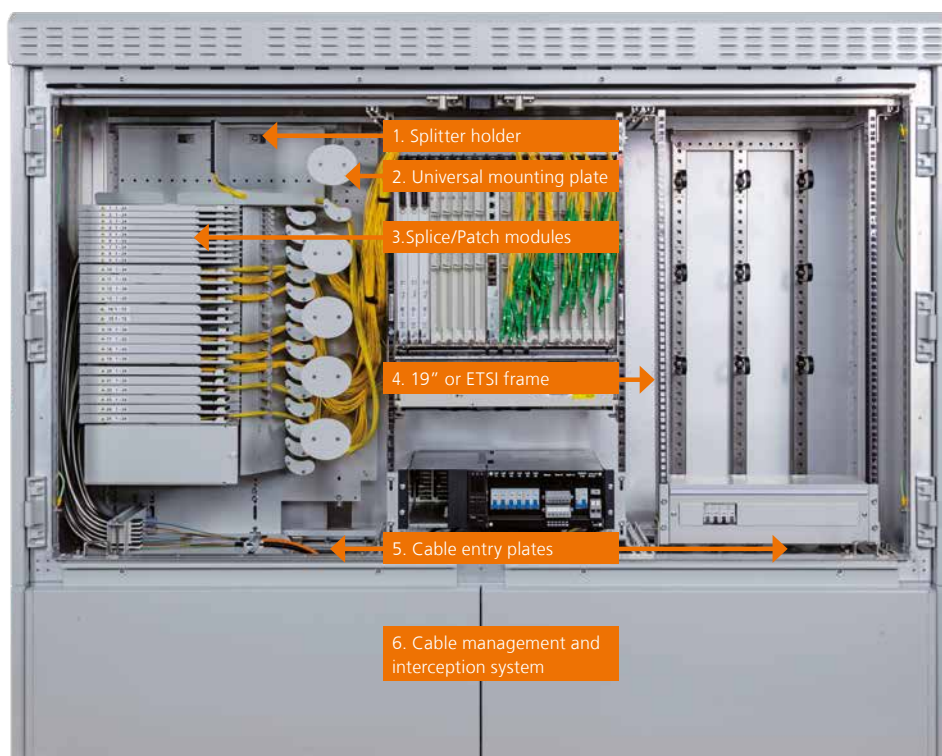
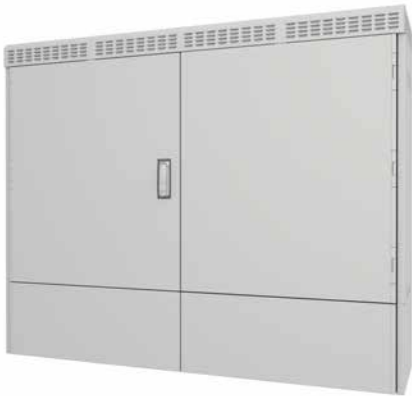


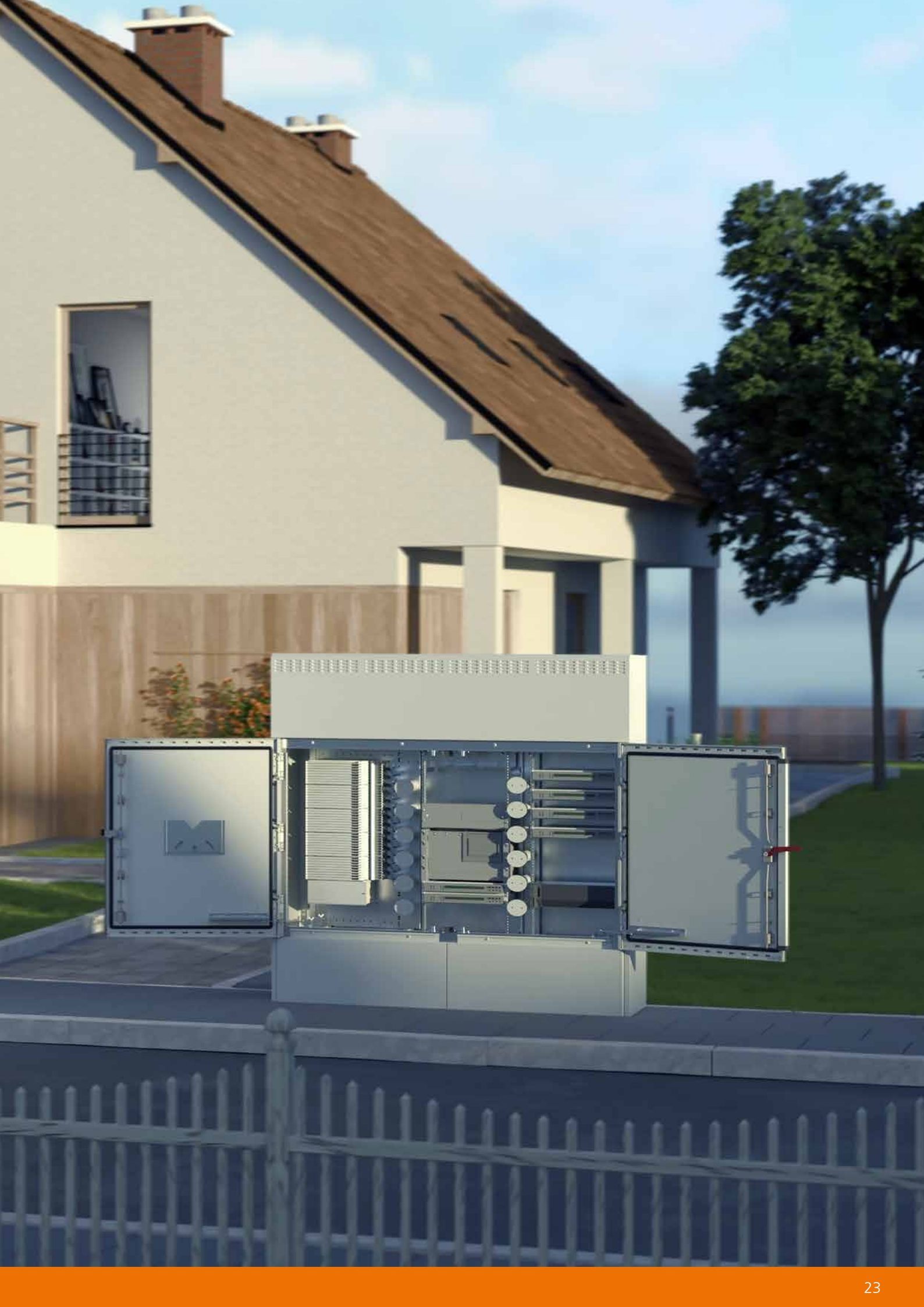
2LINE Multi-Functional Cabinet as a Mini-PoP

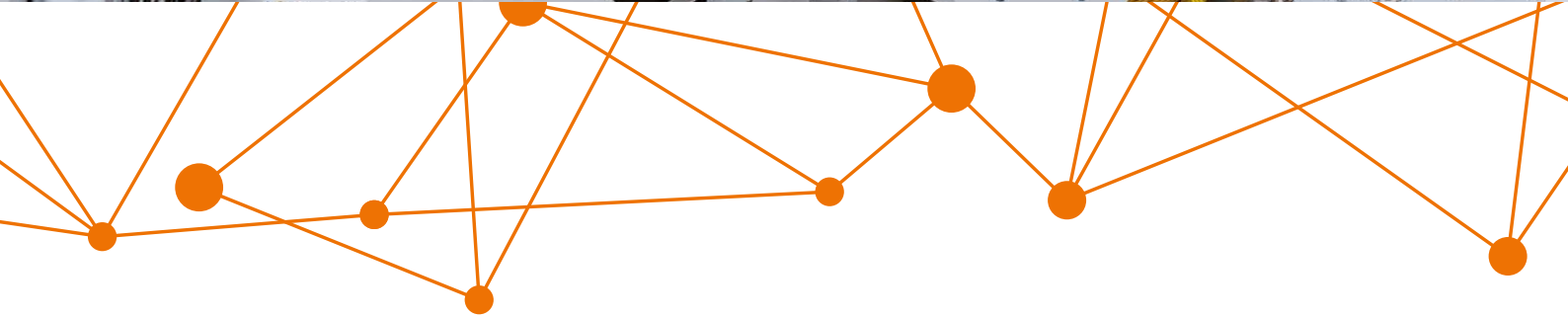
- 2LINE MFC made from aluminium with powder-coated outer surface
- Housing and base weather-resistant
- Modular interior design: passive and active technology, special solutions
- Full performance range of an ODF: modules, splitters, special modules can be integrated
- Patented V-bottom plate for gentle cable entry

2LINE Multi-Functional Cabinet with active cooling system

- Three-stage cooling system
- Waste heat cooling capacity 3,500W
- TA noise 35dB – can be used in residential areas
- Maintenance-free
- Internal cooling temperature selectable between 25 to 45 °C
- Hermetically sealed cooling circuit







2LINE MFC

Multi-Functional Cabinet

The 2LINE MFC distribution cabinet is a universal multifunctional enclosure that meets all the requirements of a modern fibre optic network.

Suitable for passive (2LINE Splice/Patch Modules) and active FTTx network technology. Adapted and equipped according to the needs of our customers in terms of size, system, air-conditioning and security, the 2LINE MFC represents an intelligent solution.

The new development of the 2LINE "Whisper-PoP" offers further advantages:

No failure of the active technology due to high temperatures. No penetration of contaminants or moisture into the interior. Maintenance-free and safe operation of the passive and active technology is thus ensured for decades.

Even the highest TA noise limits are complied with and the compact external dimensions ensure that the "Whisper-PoP" can be set up almost anywhere without additional construction approval.



- MFC housing made of aluminium with powder-coated outer surface
- Installation of 2LINE Fibre optic extension with 2LINE Splice/Patch Modules and 2LINE Splitters
- Enclosure interior can be designed modularly with 19" / ETSI rack/patch cable management
- Patented V-bottom plate for bending radius-compatible insertion
- Low installation costs due to pre-assembly
- Enclosure modularly replaceable in case of damage



2LINE MFC 8

- Housing HxWxD[mm]: 1600x1000x500
- Base HxWxD[mm]: 510-660x1000x500



2LINE MFC 12

- Housing HxWxD[mm]: 1600x1400x500
- Base HxWxD[mm]: 510-660x1400x500



2LINE MFC 15

- Housing HxWxD[mm]: 1600x1700x500
- Base HxWxD[mm]: 510-660x1700x500



2LINE MFC 18

- Housing HxWxD[mm]: 1600x2000x500
- Base HxWxD[mm]: 510-660x2000x500



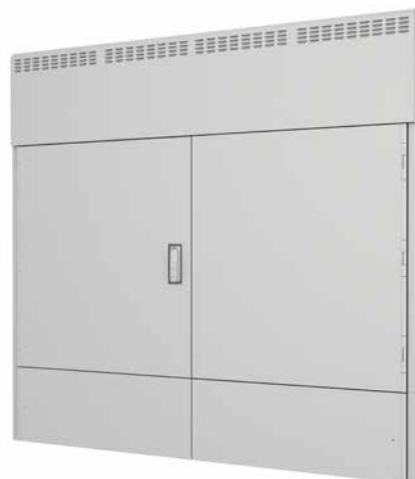
2LINE MFC 18 with three doors

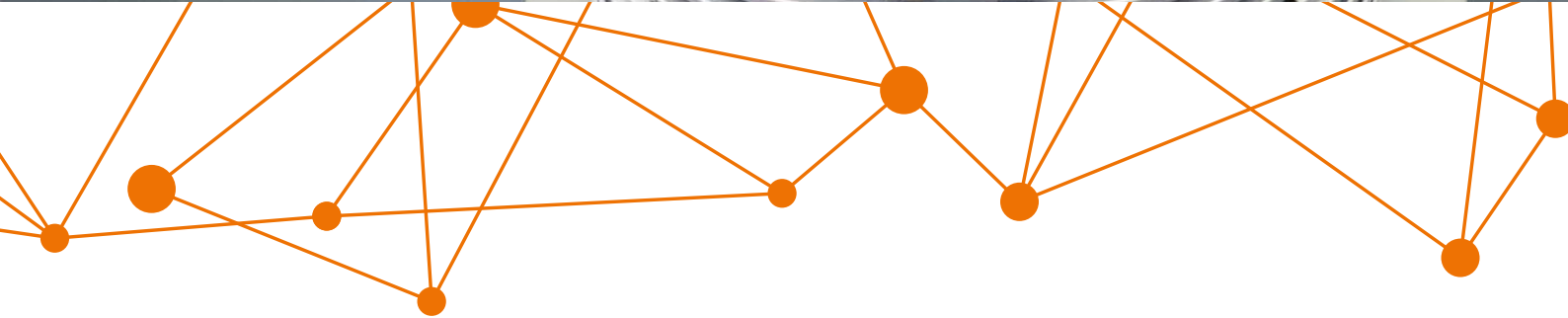
- Housing HxWxD[mm]: 1600x2000x500
- Base HxWxD[mm]: 510-660x2000x500



2LINE MFC 18 with active cooling system

- Housing HxWxD[mm]: 1940x2000x500
- Base HxWxD[mm]: 510-660x2000x500





2LINE NVt

Network Distributor

The 2LINE NVt is an organised network distributor and above-ground distribution point in the FTTx network.

It has an orderly tube, cable and splice management and thus fulfils all the requirements of modern fibre optic networks. Its intelligent cable routing system makes it particularly installation-friendly.

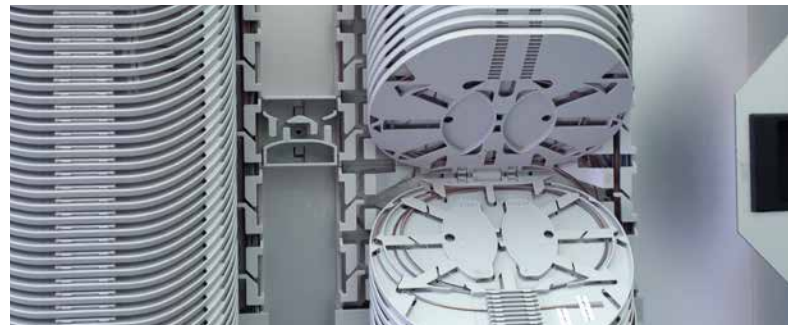
The patented 2LINE Cassette management offers the highest quality of workmanship and practical benefits, thanks to self-locking cassettes and the possibility of integrating splitters.

For on-site installation, the complete pipe assemblies are simply inserted through the base plate.

This results in an orderly storage of all pipe assemblies with little expenditure of time. By attaching individual seals for the respective pipe assemblies, they are sealed at the transition to the interior of the enclosure.



- NVT housing made of polycarbonate
- Use of the patented 2LINE E&MMS Cassette system
- Cross-routing of the optical fibre from Cassette block to cassette block
- Use as passive Network Distributor for GPON and Point to Point (PtP) technology
- Can be used as a collocation distributor



2LINE NVt 81

Housing HxWxD[mm]:
1.398x442x310

Typical application:
48 micro tubes

2LINE Cassette module
with max. 60 slots



2LINE NVt 82

Housing HxWxD[mm]:
1.398x754x310

Typical application:
96 micro tubes

2LINE Cassette module
with max. 144 slots



2LINE NVt 83

Housing HxWxD[mm]:
1.398x1131x310

Typical application:
144 micro tubes

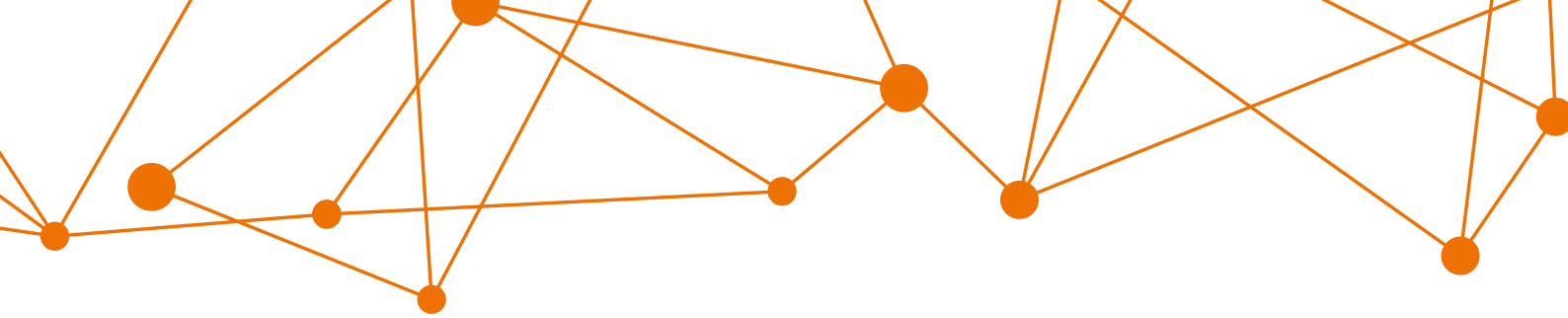
2LINE Cassette module
with max. 216 slots



- Cable interception, overlength management and loop function
- Base unit for feeding through and sealing the microducts and main cables







2LINE COB

Customer Outlet Box

The 2LINE COB is a wall-mounted distributor that combines the function of a network distributor with the possibility of using patch panels.

These wall-mounted distributors are used in buildings or small control cabinets. The IP54 protection class feature enables installation indoors or outdoors. The cables are fed into the enclosure from below and are intercepted and sealed there.

The 2LINE COB is available as a splice-through solution or as a splice-patch solution.

Because of the different sizes and the modular construction a wide range of requirements can be realised and can be implemented according to customer requirements.

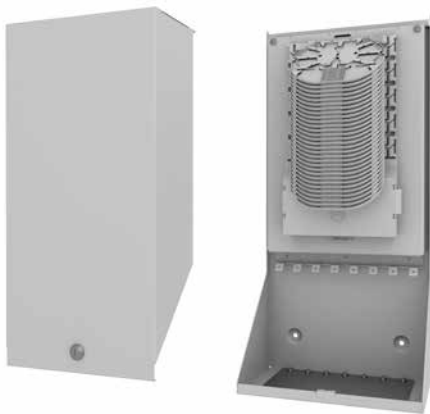


- Variable expansion for splicing and/or patching
- Installation of the patented 2LINE E&MMS cassette system
- Possibility to install splitters
- Loose tube overlength storage and cable loop
- Powder-coated sheet steel housing
- Can be used indoors and outdoors



2LINE COB S

- 1-row 2LINE Cassette system
- HxWxD[mm]: 540x265x160mm
- Splice-through solution:
Possibility for max. 360 splices (crimp).
- Splice patch solution:
Possibility for max. 360 splices (crimp)
and patch field for max. 24 couplings



2LINE COB M

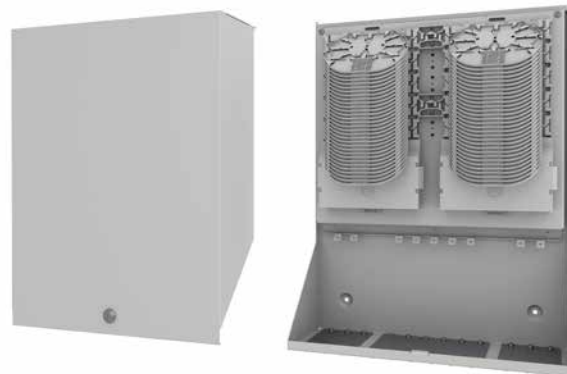
- Max. 2-row 2LINE Cassette system
- HxWxD[mm]: 540x425x160mm
- Splice-through solution:
Possibility for max. 720 splices (crimp).
- Splice patch solution:
Possibility for max. 360 splices (crimp)
and patch field for max. 60 couplings





2LINE COB L

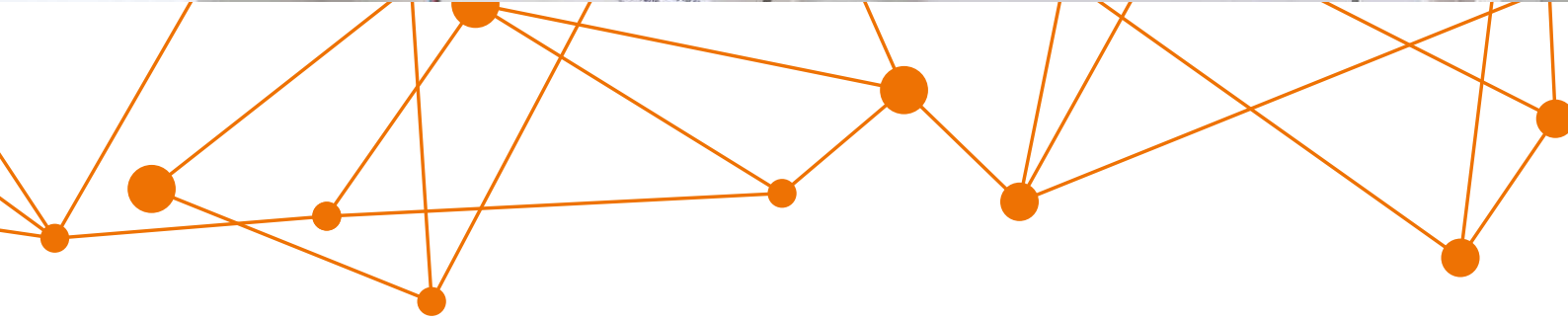
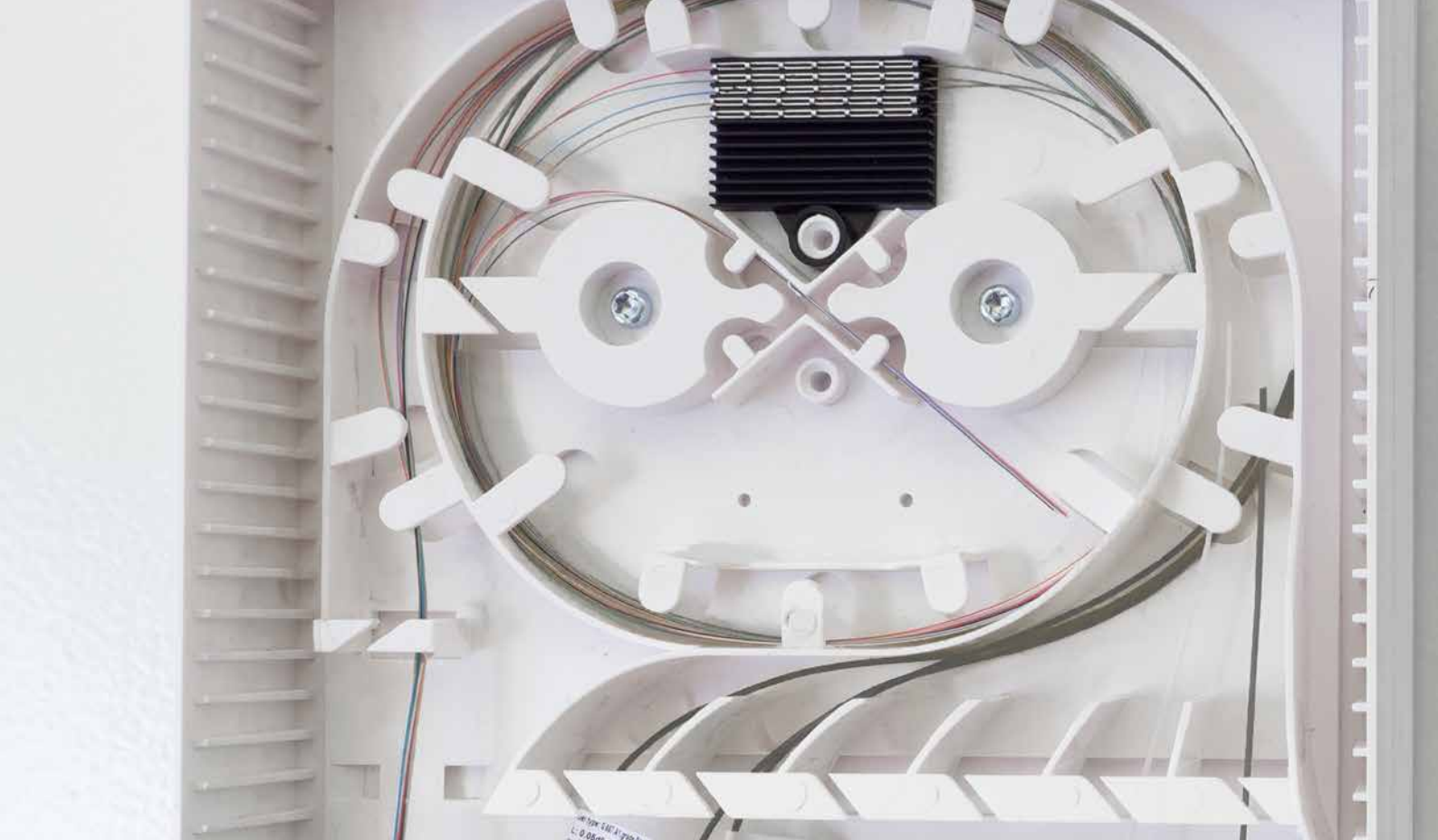
- Max. 3-row 2LINE Cassette system
- HxWxD[mm]: 617x640x160mm
- Splice-through solution:
Possibility for max. 1,512 splices (crimp).
- Splice patch solution:
Possibility for max. 1,008 splices (crimp)
and patch field for max. 84 couplings



2LINE COB L / split cover

- max. 2-row 2LINE Cassette system
- HxWxD[mm]: 617x640x160mm
- Splice patch solution:
Possibility for max. 1,008 splices (crimp)
and patch field for max. 84 couplings
- Split cover for two separate accesses





2LINE Gf-AP and TA

Fibre optic termination points and subscriber connection boxes

The 2LINE product range is rounded off by fibre optic termination points and subscriber connection boxes, which are used in all projects in both subsidised and self-supported expansion.



- Suitable for subsidised expansion
- Development and production Made in Germany
- Assembly-friendly termination points



2LINE Hermes BOX Fibre optic termination point

- HxWxD[mm]: 235x172x36
- Installation space for 6 couplings
- Closure: self-locking, safety screw, lead seal



2LINE Zelos BOX Fibre optic termination point

- HxWxD[mm]: 300x194x64
- Installation space for 12 couplings
- Closure: self-locking, lock, safety screw, lead seal



2LINE Zelos⁺ BOX Fibre optic termination point

- HxWxD [mm]: 300x194x64
- Installation space for 12 couplings
- Installation of the patented 2LINE E&MMS cassette system
- Closure: self-locking, lock, safety screw, lead seal





2LINE Iris BOX Subscriber connection box

- HxWxD[mm]: 120x80x25
- Installation space for 2 couplings
- Can be mounted on flush-mounted box
- Closure: self-locking and adhesive seal



2LINE Athene BOX Fibre optic termination point and subscriber connection box

The Athene BOX can be installed as a Gf-AP in a residential building or as a TA in a residential unit on a flush-mounted socket or mounted on a wall. It fulfils all the requirements of the material concept of the state and is therefore also ideally suited for subsidised expansion.

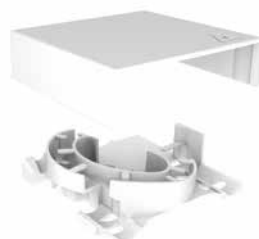
- HxWxD[mm]: 135x96x27
- Installation space for 3 couplings
- Mounting on flush-mounted box possible
- Closure: self-locking, screw or lead seal

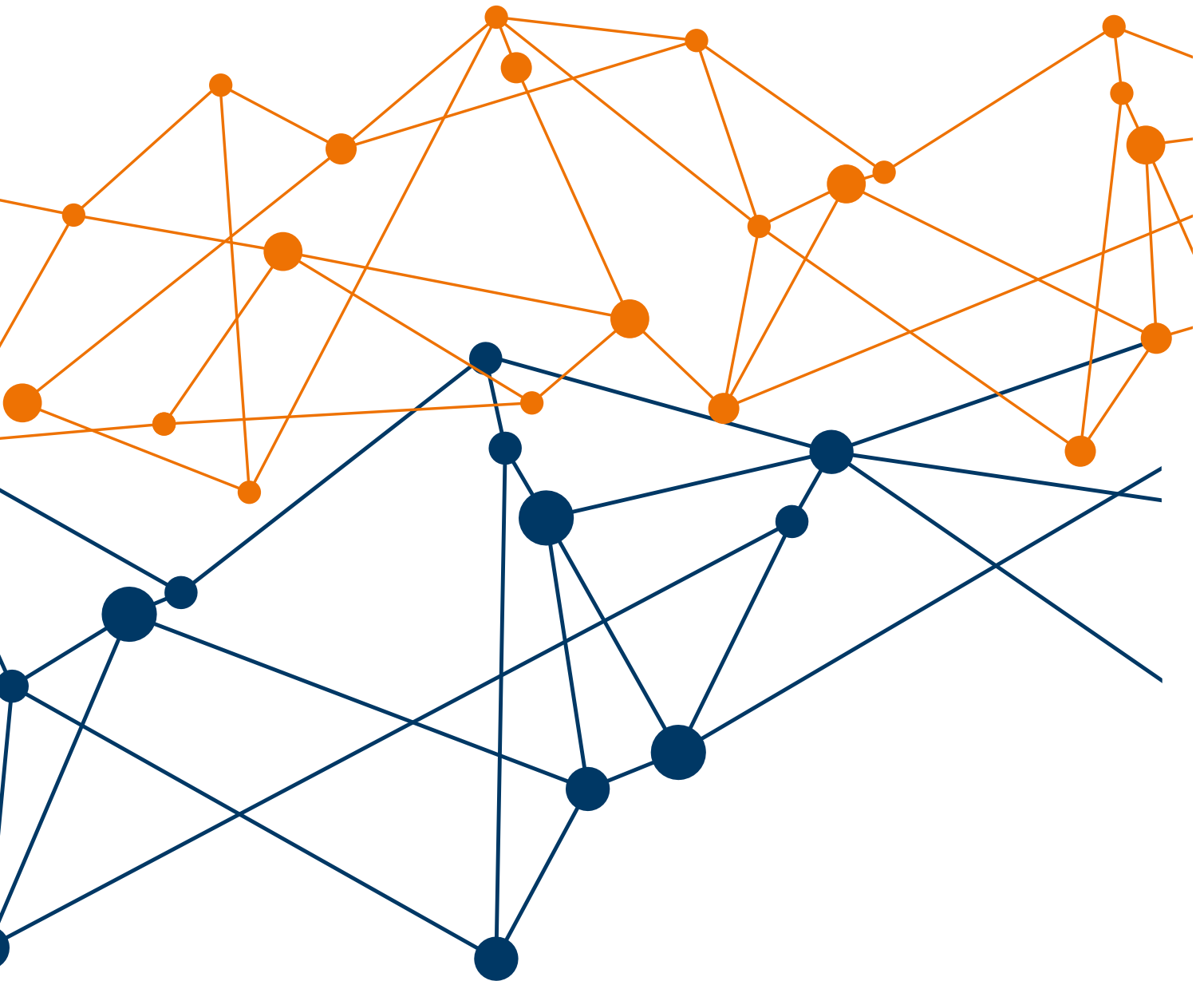


2LINE Athene KÜB Cable overlength box

The 2LINE Athene KÜB allows for the overlength compensation of cable whips.

- HxWxD[mm]: 90x96x27
- Insert for cable overlength storage
- Closure: self-locking





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