How can high-speed interconnect solutions drive next generation AI data centres at 448G and beyond?

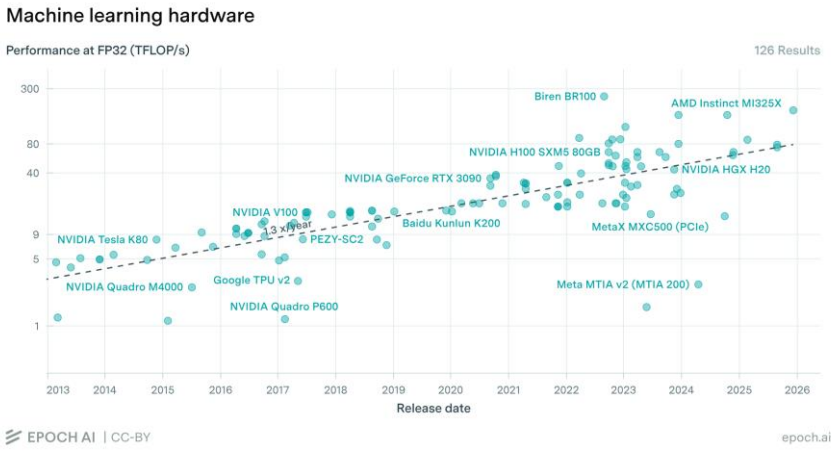
Dr. Hendrik Coldenstrodt
Chief Technology Officer
Computing and Transportation Business Group
BizLink Group

© 2026 BizLink Group. All Rights Reserved
Confidential

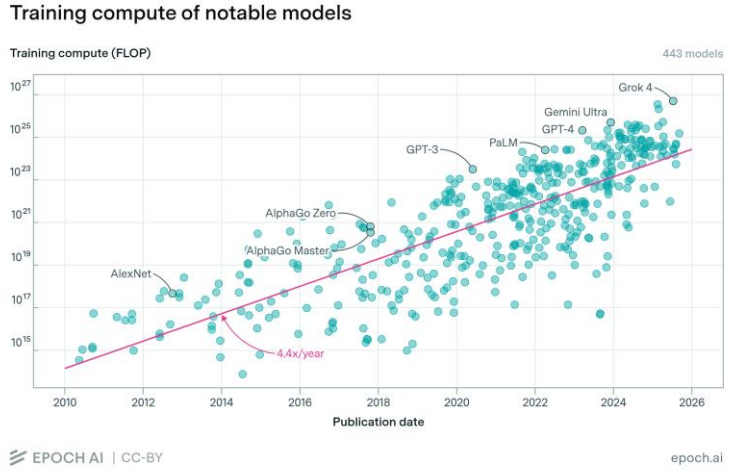
BizLink

Compute power has been growing exponentially

One constant across all applications – AI factories need high data rates



Epoch AI, 'Data on machine learning hardware'. Published online at epoch.ai. Retrieved from 'https://epoch.ai/data/machine-learning-hardware' [online resource]. Accessed 10 Oct 2026.



Robi Rahman and David Owen (2024), "The training compute of notable AI models has been doubling roughly every six months". Published online at epoch.ai. Retrieved from 'https://epoch.ai/data-insights/compute-trend-post-2010' [online resource]. Accessed 10 Oct 2026.

© 2026 BizLink Group. All Rights Reserved
Confidential

BizLink

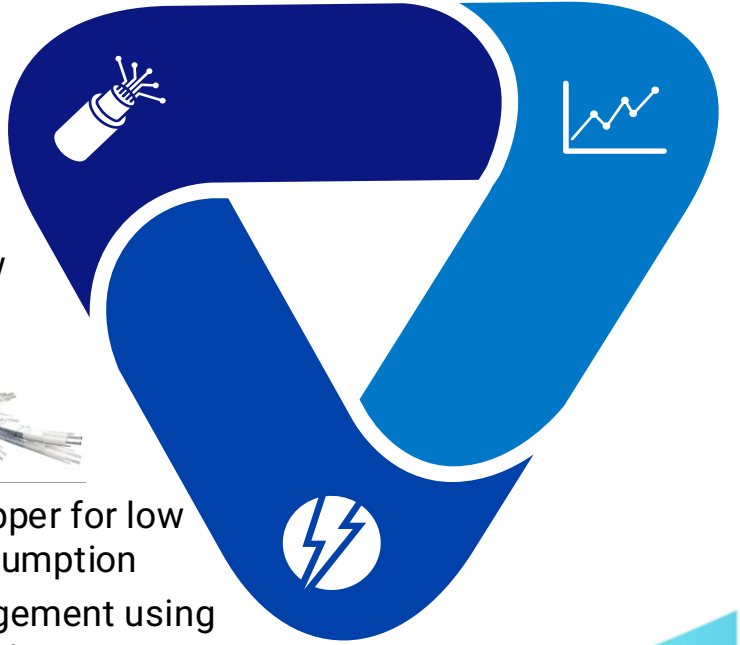
Copper connectivity facing growing challenges

„There will always be a place for copper“ (?)

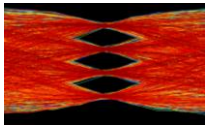
- Cable weight and size
- Things getting crowded
- Need higher density
- Require tighter bends
- Avoid impeding on airflow

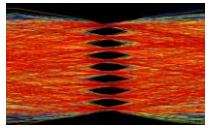


- Passive copper for low power consumption
- Heat management using liquid cooled connectors



- Keeping PAM 4 coding will push Nyquist frequency past 100 GHz
- Denser coding tightens SNR requirements



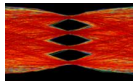
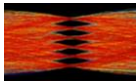
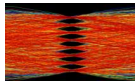


© 2026 BizLink Group. All Rights Reserved
Confidential

BizLink

Pushing towards 448G

How does the “copper wall” look like

	PAM 4	PAM 6	PAM 8
			
Bits / symbol	2	2.585	3
Symbol rate	224GBd	173GBd	150GBd
Nyquist frequency	112GHz	87GHz	75GHz
SNR vs. PAM 4	0dB	-4.4dB	-7.4dB

Considerations for a copper solution

- Keeping PAM 4 coding will push Nyquist frequency past 100 GHz
- IL will already be difficult for copper at lower frequencies

Denser coding with challenges on its own

- Tighter SNR requirements
- Increased return loss and cross-talk influence

Other constraints making things difficult

- Dense packing and tighter bends
- Operational environments
- Assembly/system margins

© 2026 BizLink Group. All Rights Reserved
Confidential

BizLink

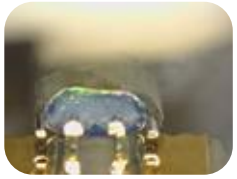
One can only improve what one can measure

Need a well-defined measurement system to get reliable (reproducible) measurements



Sample preparation, e.g.

- Length of stripped wire
- Stripping symmetry



Sample installation, e.g.

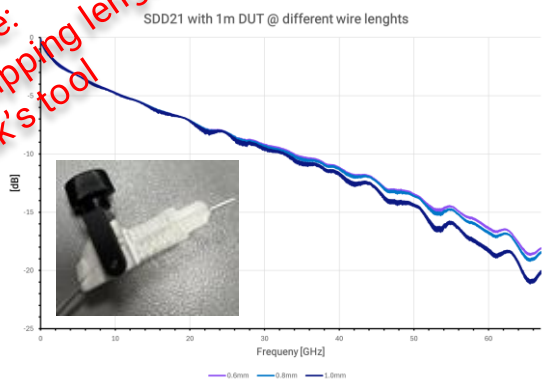
- Positioning on pads
- Forces of clamps



Measurement setup, e.g.

- PCB design and symmetry
- De-embedding

Example:
Influence of stripping length
BizLink's tool



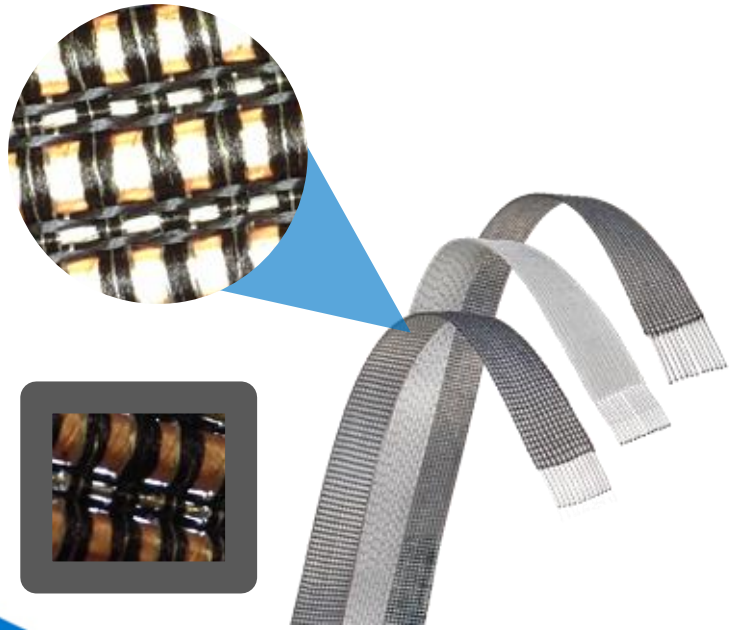
Stripped length [mm]	1.0	0.8	0.6
IL @53GHz [dB]	-16.4	-15.0	-14.7

© 2026 BizLink Group. All Rights Reserved
Confidential

BizLink

Woven flat cables

For flexible internal and external high-speed interconnects



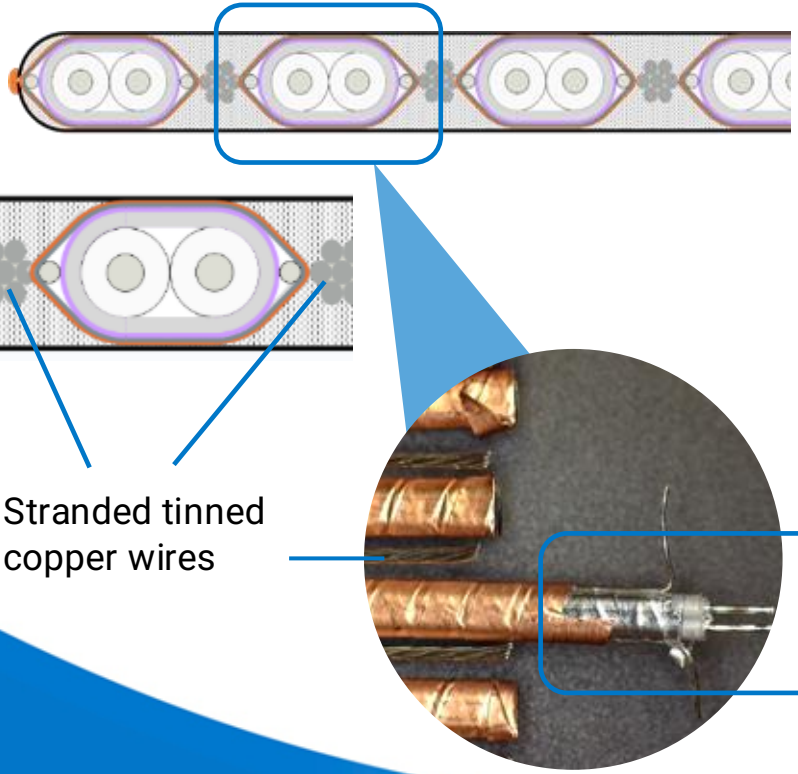
- Flat configuration: up to 24 high-speed pairs.
- Patented woven design for reduced diameter and increased flexibility.
- Excellent electrical performance due to low strain weaving
- Woven structure improving airflow (no need for lamination)
- Easy to separate in assembly.
- Customization possible (e.g. flat-round-flat)

© 2026 BizLink Group. All Rights Reserved
Confidential

BizLink

Design details of woven flat cables

Versatility and flexibility



Stranded tinned copper wires



Enabling tight bends
vs.
Traditional mesh



Ethernet and PCIe with parallel pair:

- 26AWG to 34AWG silver plated copper wire with FEP or PE insulation and different foil and taping configurations

Combinations with fibre optics, power delivery, and coaxial cables possible

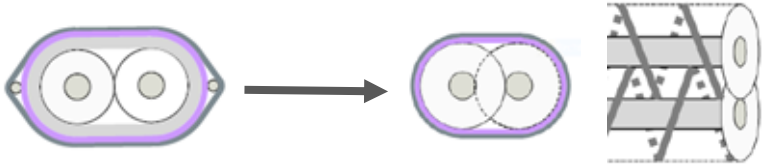
© 2026 BizLink Group. All Rights Reserved
Confidential

BizLink

Double-helix design

It’s all about symmetry and dielectric constant

How do we improve signal integrity



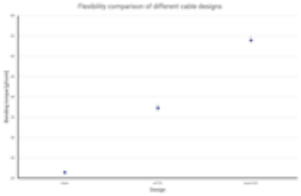
- Small distance between wires.
- Low dielectric constant ε_r
- Solid ε_r > Foamed ε_r
- “Yarn” solution like extreme foam high ε_r

- Replacing the wire insulation with thin insulating yarn (e.g. PE, FEP, ePTFE, PP)
- Coupling of signal wires at sweet-spot

Measured significantly better flexibility



- Fixed, small distance between wires
- Low intrinsic torsion – highly flexible

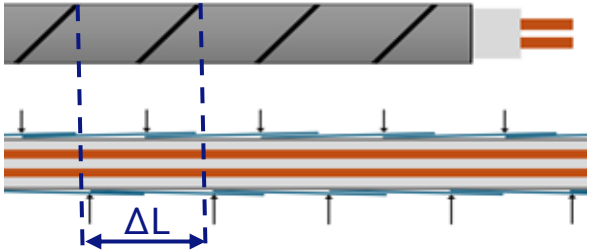


© 2026 BizLink Group. All Rights Reserved
Confidential

BizLink

Overcoming bandwidth limitations on cable design

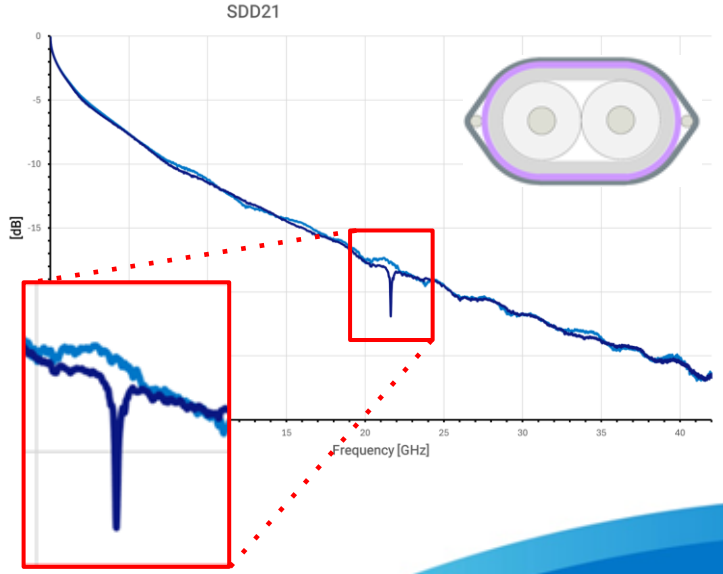
Tackling the notch filter



Taping pitch ΔL [mm]	4.0	1.6	1.0
App. Resonance [GHz]	~25-30	~62-72	>=100

- Taping pitch causing periodic perturbations
- Notch filter type response at resonance
- Shorter pitch for higher frequencies pushes limits of manufacturability

Removal of notch effect in 30AWG dual drain *Paralink* pair with design impedance 92Ω



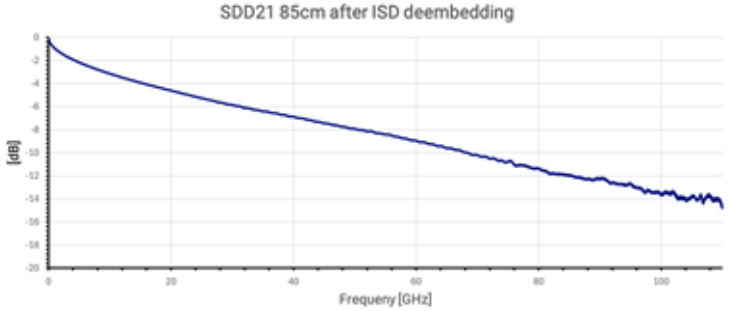
$$\Delta f = \frac{c}{2 \cdot d \cdot \sqrt{\varepsilon_r}}$$

© 2026 BizLink Group. All Rights Reserved
Confidential

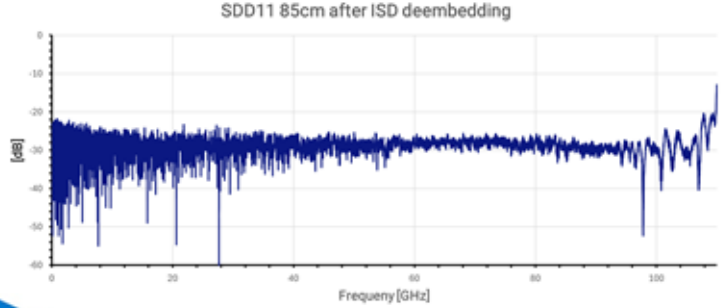
BizLink

ParaLink cable to 110GHz – de-embedded results

Ready for 448G







- Enhanced Paralink design
- Showing results for dual drain version with design impedance 92Ω
- Smooth and improved electrical parameters

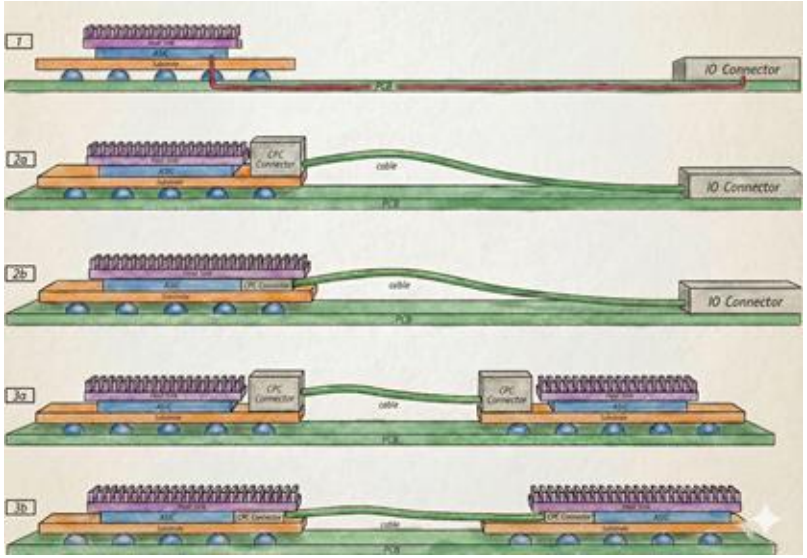
© 2026 BizLink Group. All Rights Reserved
Confidential

BizLink

Building an ultra-slim cable for up 448G CPC

Demo at booth B29

Paralink 39AWG use case with Rosenberger TeraNano



PCB routing losses, e.g. Megtron 6 IL ~-35dB/m @20GHz vs. Paralink better than -15dB/m

- Need ultra-slim cable to move closer to ASIC
- Working with Rosenberger
- Their small form factor TeraNano
  10mm x 18mm for 32 differential pairs
  Mating height <6mm



- BizLink's Chip-to-module with OSFP cage and boardside connector

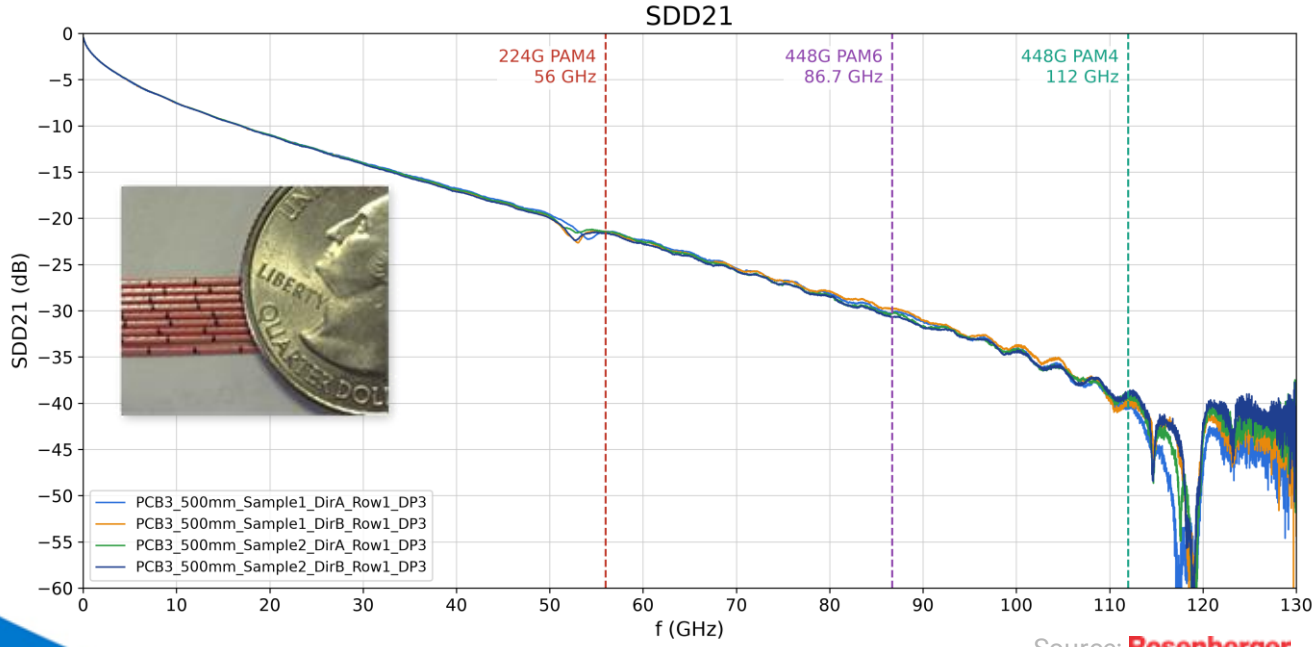


© 2026 BizLink Group. All Rights Reserved
Confidential

BizLink

CPC system performance up to 110GHz

Performance for 448G at PAM4 and PAM6



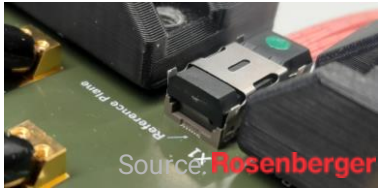
Source: Rosenberger

Demo at booth B29

No-drain AWG 39 cable with inner jacket.

ParaLink®
92Ω 1 Pair 39AWG CCS VS

Custom test fixture



© 2026 BizLink Group. All Rights Reserved
Confidential

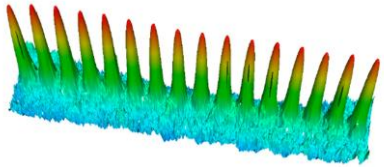
BizLink

Optical interconnect solutions…

Low loss and high-density patch cords with (multi-)fibre connectors

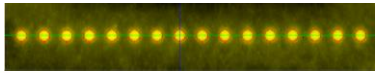
ultra low loss

MMC patch cord



Typical loss
< 0.1dB





Multiple options



- SM, MM, and PM
- SC, LC, FC, ST, and more
- MTP, MPO, MMC, SN, and more
- Break-/Fan-outs

- Typical MPO and MMC IL<0.1dB

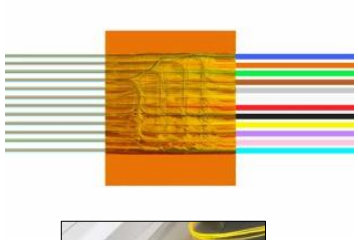
© 2026 BizLink Group. All Rights Reserved
Confidential

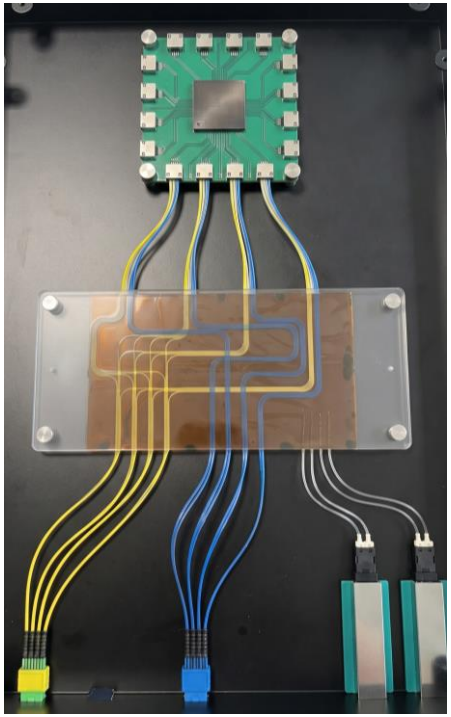
BizLink

…for NPO and CPO

Fibre attach units, shuffle boxes, and alignment

Fibre shuffle box





Fibre attach units



© 2026 BizLink Group. All Rights Reserved
Confidential

BizLink

BizLink

Where Possibilities Connect™

Contact

Dr. Hendrik Coldenstrodt
Chief Technology Officer
CTBG

E-Mail:
hendrik_coldenstrodt@bizlinktech.com