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FIBER OPTIC BACKBONE

FOR NEXT-GENERATION ROLLING STOCK

A standardized, train-ready connectivity platform for data-intensive railway applications.

IoB PIS FRMCS PACIS

Connecting today. Enabling tomorrow.

CUSTOMER VALUE

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Why fiber is becoming the backbone of the digital train

More bandwidth, less installation effort, and a cleaner path to future upgrades.

CAPACITY

1–10 Gbit/s

Real data rate in the proposed standard architecture.

REACH

Up to 300 m

Multi-mode link length shown for 10 Gbit/s.

ROBUSTNESS

EMI independent

No additional interference shielding required.

COMPLIANCE

EN 45545-2 HL3

Train-ready cable and assembly concept.

Designed around the operational realities of rolling stock, not adapted from office IT.

LIFECYCLE IMPACT

The business case is broader than bandwidth

Fiber reduces physical constraints across delivery, installation, operation and maintenance.

25%

Lower cable weight

66 g/m fiber versus 88.1 g/m copper in the reference comparison.

25 mm

Bending radius

Compared with 65 mm for the referenced Cat6a cable.

1–3 W

Power per port

Referenced range for fiber, versus 3–5 W per copper port.

0

EMI shielding

Fiber cannot be influenced by electromagnetic interference.

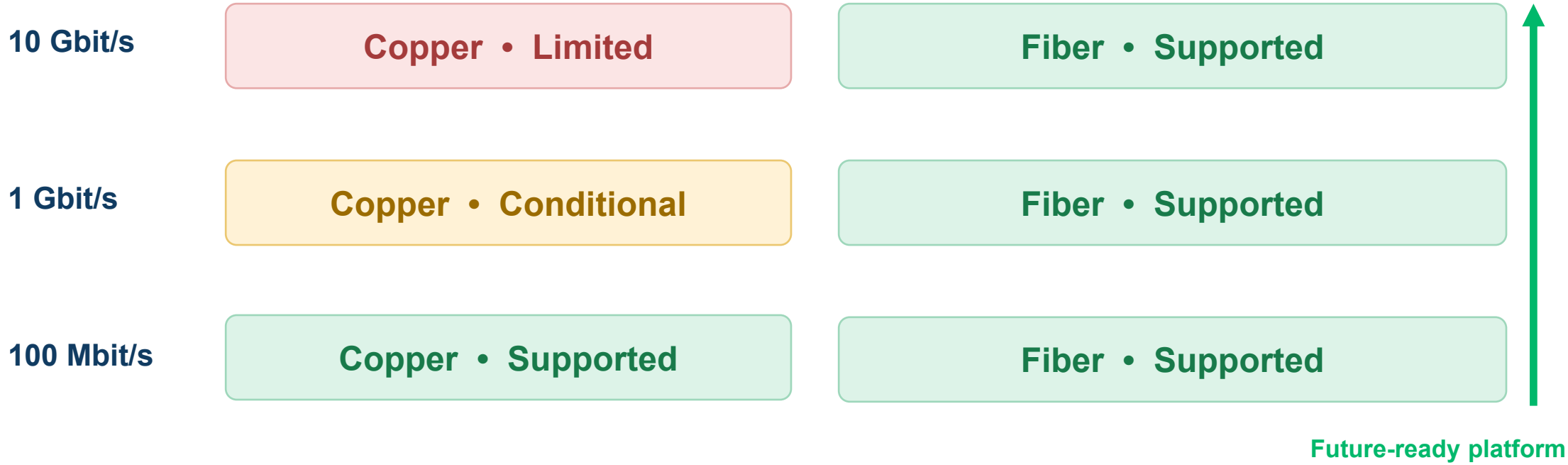
Customer impact

Lower vehicle mass • simpler routing • reduced auxiliary energy • fewer EMC-related interfaces

SCALABILITY

One backbone. Multiple performance levels.

A clear migration path from today’s networks to higher data-rate applications.

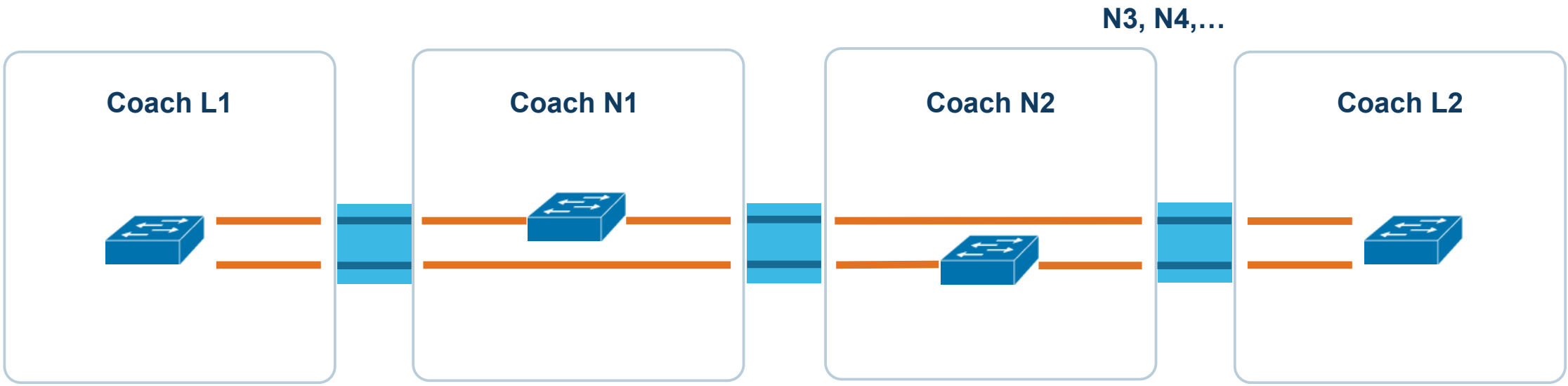


The standard offering uses multimode 50 µm OM3.

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A repeatable ring topology for every trainset

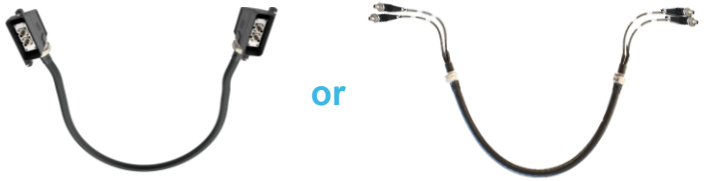
A modular backbone that maps cleanly from coach to coach.



Inside-train assemblies:



Intercar jumpers:



or

1–10 Gbit/s | Ring topology | Multimode 50 µm OM3 | EN 45545-2 HL3

MODULE 1

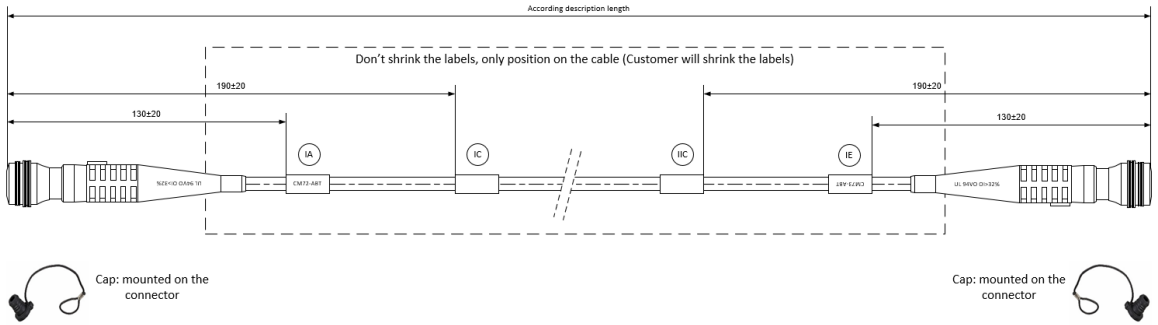
Inside-train assemblies

Factory-tested links in standardized lengths simplify installation and documentation.

STANDARD CONFIGURATION

Fibers	**2**
Length range	**0.5-50m**
Fiber	**Multimode 50 µm OM3**
Cable	**RADOX® Twinfix HL3**
Connector	**Q-ODC-2**
Fire safety	**EN 45545-2 LH3**





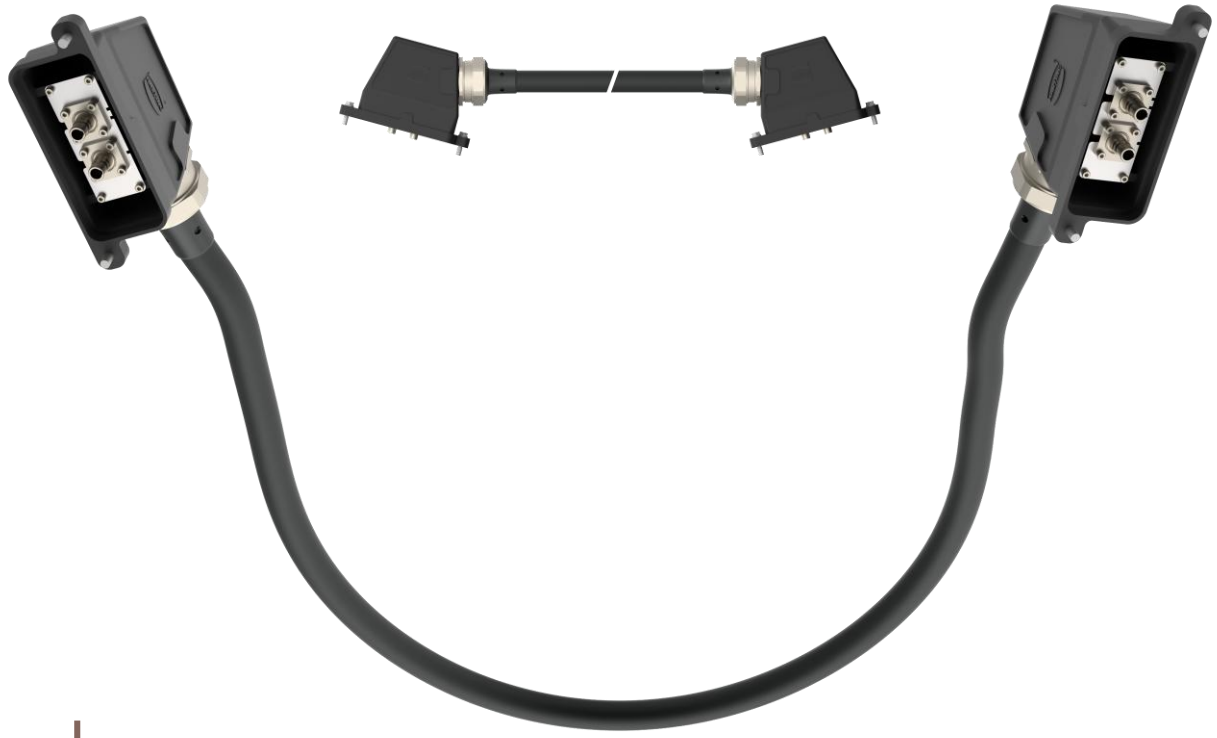
Predefined lengths reduce engineering variation while preserving train-specific routing flexibility.

MODULE 2.1

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Intercar jumper connector based

A protected, serviceable transition between coaches using the MARVELIN-**C connector** platform.





STANDARD CONFIGURATION

Fibers	**2 × 2**
Housing	**Harting HPR 16**
Standard length	**1.75 M**
Fiber	**Multimode 50 µm OM3**
Cable	**29mm composite-cable**
Connector	**2x QODC-2**
Fire safety	**EN 45545-2 HL3**

Designed for movement, accessibility and repeatable integration at the coach interface

Part: 85287619

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Intercar jumper wall-mounted

A protected, serviceable transition between coaches using the MARVELIN-**W wall-**mounted platform.





STANDARD CONFIGURATION

Fibers	**2 × 2**
Gland	**M50x1.5 x 9mm**
Standard length	**1.75 M**
Fiber	**Multimode 50 µm OM3**
Cable	**29mm composite-cable**
Connector	**2x QODC-2**
Fire safety	**EN 45545-2 HL3**

Designed for movement, accessibility and repeatable integration at the coach interface

Part: 85299986

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A compact, configurable bill of material

The architecture is built from a small number of repeatable modules.



Modul	Variant	Qty.	Reference / weblink
Inside-train assembly	2,5,10,15,20m	10	MO02_QOP6_QOP6_O375T_....._MM
Intercar jumper connector	1.75m	3	MR04_QOS….MM_MARVELIN-C
Intercar jumper wall	1.75m	0	MR04_QOE….MM_MARVELIN-W
HPR Housing	Bulkhead	6	Han 16HPR
Railway switch	1-10G capable	4	RES10G or equivalent

Result: fewer unique parts, a clear interface concept and easier configuration for new train platforms.

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FROM STANDARD OFFERING TO YOUR TRAIN PLATFORM

Let us define the optimal backbone together.

01 **Topology & data rate**

02 **Coach interfaces**

03 **Lengths & routing**

04 **BoM & qualification**

05 **Documentation (Measuring protocols, FCIL according EN45545-2)**

YOUR NEXT STEP

Share one representative train topology and target data rate.

START THE DIALOGUE



PRJ-00067328 Standard 10Gbit/s backbone solution MM OM3