



**Pushing Performance**  
Since 1945

**PEOPLE. POWER. PARTNERSHIP.**

# **HARTING** Railway News 2022

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# Content

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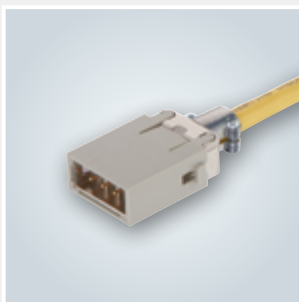
<b>Industrial Connectors Han®</b>	<b>4</b>
Han-Modular® Gigabit Cat. 8 Module	4
Han-Modular® M12 Module	5
Han-Modular® Domino Modules	6
Han® Megabit Module for PCB	7
Han® HPR VarioShell with Single Pole	8
Han® HPR Single Pole Portfolio	9
Han® HPR Compact	10
Han® HPR Compact U Connector	11
Han® HPR Compact Surface Mounting Housing	12
Han® HPR PYD 1 to 1 & 1 to 2	13
Han® HPR HPTC	14
Han® HPR TrainPowerLine	15
<b>Industrial Ethernet Switches</b>	<b>16</b>
Ha-VIS eCon 4080 M12 PushPull Switch	16
Ha-Vis eCon 2000 ix Industrial® Switch	17
<b>PCB connectors</b>	<b>18</b>
<i>har-flex</i> ® Hybrid	18
<i>har-flex</i> ® Power	19
<i>har-modular</i> ®	20
SEK Mezzanine	21
<b>Interface connectors</b>	<b>22</b>
D-Sub coding system	22
HARTING ix Industrial® AWG 22	23
HARTING ix Industrial® 90° angled	24
HARTING Mini PushPull ix Industrial®	25

<b>Circular connectors</b>	<b>26</b>
HARTING UIC 558 connector	26
M12 SPE T1	27
M12 PushPull according IEC 61076-2-010	28
M12 S- & K-coding acc. IEC 61076-2-111	29
<b>System Cabling</b>	<b>30</b>
M12 system cabling	30
Han® S 200 system cabling	31
HARTING ix Industrial® to	
M12 X-coded panel feed through	32
<b>Customised Solutions</b>	<b>33</b>
FO communication systems (FOCS) –	
expanded beam modules	33
Competence Center inter-vehicle jumper solutions	34

# Industrial Connectors Han®

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## Han-Modular® Gigabit Cat. 8 Module



More and more applications on Rail Vehicles communicate via Ethernet connections and existing ones require higher transmission rates. The new Han-Modular® Gigabit Module Cat. 7A/8.2 transmits data in and between the carriages without interference.

- Significantly improved signal integrity increases the immunity to interference
- Up to 40 Gbit/s at an operating frequency of up to 2000 MHz
- Future-oriented Cat. 8.2 interface for continually increasing data transmission rates
- Can be flexibly combined with modules from the Han-Modular® series



<https://b2b.harting.com/396010>

## Han-Modular® M12 Module



Thanks to the M12 module, there is now another way to integrate 10 Gbit/s Ethernet into modular connectors. The module significantly reduces the space requirements, since two D- or X-coded M12 connectors fit into a single module.

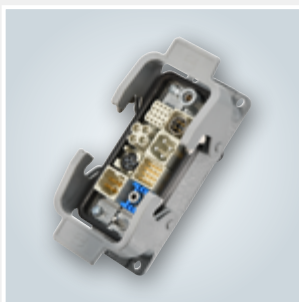
- Saves costs by significantly reducing space requirements and weight
- Improved safety due to new complex shielding design options, thanks to the new M12 module GND version



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# Industrial connectors Han®

## Han-Modular® Domino Modules



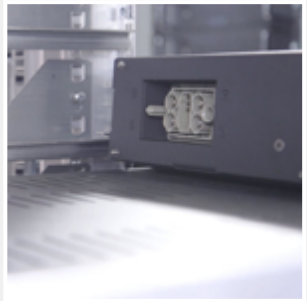
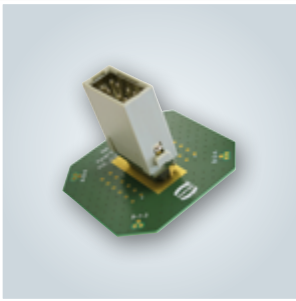
With the introduction of the Han-Modular® in 1993, HARTING set a new standard in the industry: delivering the first modular industrial connector that carries power, signals, data and even compressed air side by side in a single connector. Almost 30 years later, HARTING is setting the next milestone with the new Han-Modular® Domino Modules. These hybrid modules deliver up to 50% additional space savings.

- Up to 50% less space due to smaller and lighter connectors
- Maximum flexibility, scalable to meet your requirements
- Shorter installation times because several individual connections are combined
- Compatible with existing components of the Han-Modular® series
- Sustainable thanks to consistent modularisation



<https://b2b.harting.com/34113>

## Han® Megabit Module for PCB



With the new PCB adapter for the Han® Megabit module it is now possible to transmit shielded signals from a modular industrial connector directly to the PCB. The newly developed module combined with the new PCB adapter allows a seamless transmission of the shielding and ensures the signal integrity. In addition, the new PCB solution is completely pre-assembled and can be integrated by the plug & play principle.

- Signal transmission up to Cat. 5e
- Cost saving due to pre-assembled components (plug & play)
- Compatible with other PCB adapters from Han-Modular® portfolio
- Versions for 1.6 and 2.4 mm PCBs available

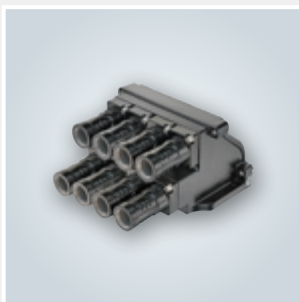


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# Industrial connectors Han®

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## Han® HPR VarioShell with Single Pole



HARTING has developed the Han® HPR VarioShell as a particularly flexible solution for jumper cable connections. The housing forms an open system that accommodates connectors for the transmission of power and other connectors within it. The system now offers space for eight 250/350 A contacts or six 650 A contacts in single poles.

- Longer lifetime due to optimised design against water, dust and ice
- Time saving during the whole installation process due to free access from all directions
- High flexibility through compatibility with the complete Han® HC Modular and Han® HPR Single Pole portfolio



## Han® HPR Single Pole Portfolio

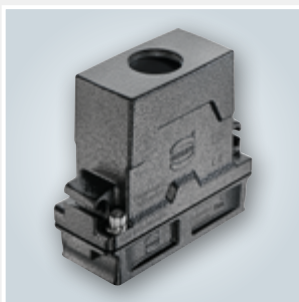


The new Han® HPR Single Pole portfolio complements the VarioShell housings perfectly. The Single Poles transmit power up to 650 A/4 kV AC/DC through reliable Han® HC Modular contacts. The result is high-performance connectors in HPR housings with IP68/69 protection. Up to eight 250/350 A contacts or six 650 A contacts can be accommodated.

- High flexibility due to new housing options for the Han® HPR VarioShell
- Reduces handling weight as single wires can now be connected
- Safe assembly due to integrated coding pins
- Complexity reduction due to standardisation and simplification

# Industrial connectors Han®

## Han® HPR Compact



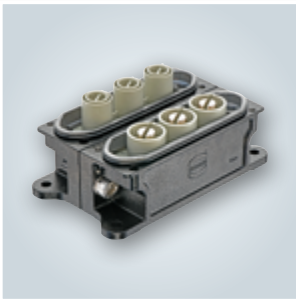
With the new Han® HPR Compact, HARTING satisfies the industry's requirements for reduced installation space and weight. Due to the smaller connectors, installation areas that are difficult to reach can now be accessed more efficiently, and spaces once too cramped may now be considered for installation (e. g. in the narrow installation space of railway vehicles.)

- Up to 25% less weight compared to the previous standard housing
- Can be installed in the tightest of spaces thanks to the space reduction of up to 20 %
- Can be safely assembled in narrow installation spaces by means of “blind mating” using guide pins
- Very flexible and expandable with the extender frame



<https://b2b.harting.com/483980>

## Han® HPR Compact U Connector



HARTING's new Han® HPR Compact U-Adapter enables new opportunities for power distribution. The interface can be used in areas where the incoming and outgoing cables come from the same direction. The body is pre-assembled and can be directly mounted.

- Cost reduction due to elimination of distribution boxes
- Time and cost savings due to coded plug & play solution
- Complexity reduction due to standardisation and simplification



<https://b2b.harting.com/483979>

# Industrial connectors Han®

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## Han® HPR Compact Surface Mounting Housing



The new Han® HPR Compact Surface Mounting Housings complement the Han® HPR Compact portfolio and increase flexibility with less space and weight requirements. The housings will be available from size 6 up to size 24.

- Can be installed in the tightest of spaces thanks to the space reduction of up to 10 %
- Less weight compared to the previous standard housing
- Safe assembly in narrow installation spaces by means of “blind mating” using guide pins



<https://b2b.harting.com/483979>

## Han® HPR PYD 1 to 1 & 1 to 2



HARTING's new Han® HPR PYD 1 to 2 connector offers a scalable power interface (e.g. to the bogie). The distributor unites the contact multiplication in a standard connector and, thus, provides outstanding flexibility.

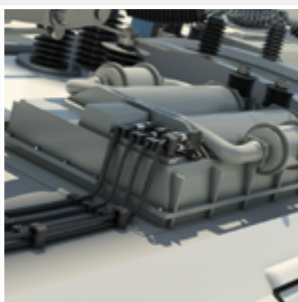
- Contact multiplication in a standard connector ensures outstanding flexibility
- Reduced costs due to elimination of distribution boxes
- Saves time because shielded motor cables can be plugged in (e.g. when replacing bogies)
- Coded Plug & Play solution saves time and money (no electricians required)



<https://b2b.harting.com/56994>

# Industrial connectors Han®

## Han® HPR HPTC



Transformer connections are exposed to environmental influences. Mechanical effects, water, oil, direct sunlight and ozone are just some of these possible influences that can significantly affect the service life of the connections. The new Han® HPR HPTC series has been specially developed for transformer applications in harsh environments.

- Safe solution through compliance with relevant railway standards (EN 50467, EN 50124-1, IEC 61373, EN 45545, EN 60137)
- Longer lifetime due to Han® HPR standard materials for harsh environments
- Time savings due to easy installation and shielding without shrinking or taping
- Cost savings due to minimum inventory needed based on efficient coding system



<https://b2b.harting.com/483853>

## Han® HPR TrainPowerLine



More efficient energy consumption and the reduction of complexity are important trends in the rail industry. Rail vehicle manufacturers are always looking for ways to reduce the weight of their vehicles. In addition, installation processes must be clear and understandable to save time for assembly teams. With the new Han® HPR TrainPowerLine (TPL), HARTING has developed a new interface to meet all these requirements.

- Weight savings of up to 10 kg per wagon compared to the well-known UIC 552 interface
- Time savings due to reduced complexity and a clearly structured system that is based on a small number of components
- Error reduction during installation due to the pre-assembled main body
- High flexibility due to a single system compared to existing solutions on the market

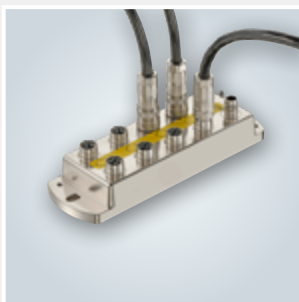


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# Industrial Ethernet Switches

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## Ha-VIS eCon 4080 M12 PushPull Switch



The compact Ethernet switch Ha-VIS eCon 4080GBT-BXT supports reliable network solutions even under environmental conditions of humidity, dust and vibrations. The 8 Port Gigabit switch enables cost-effective and fast expansion or modification of network infrastructures with high bandwidth requirements in rail vehicles.

- 8 Port Gigabit Switch unmanaged in protection class IP67
- Flat design for usage in areas with limited installation space
- Standardized M12 PushPull (x-coding) acc. IEC 61076-2-010
- Tested acc. EN 50155 for EMC, shock vibration and climatic



<https://b2b.harting.com/20774080000>



## Ha-Vis eCon 2000 ix Industrial® Switch



With the Ha-VIS eCon 2000GX-I-A unmanaged Ethernet switches, HARTING provides high-performance Gigabit switches for end-to-end networking via ix-Industrial®. With the compact and ultra-flat devices, limited mounting space can be optimally utilized.

- 5 and 8 port Gigabit Switches
- DIN-Rail or wall mounting
- Miniaturized interface according to IEC 61076-3-124 (ix-Industrial®)
- Shock and vibration proofed acc. to IEC 61373, Cat. 1b



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# PCB connectors

## *har-flex*® Hybrid



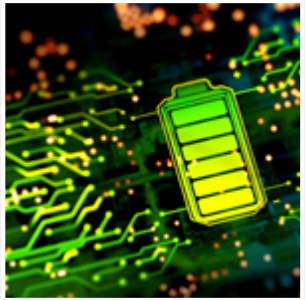
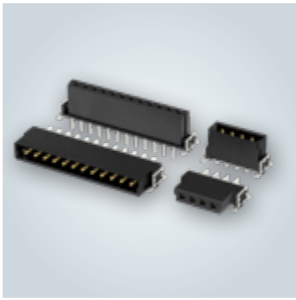
A special feature of the *har-flex*® product family and modular manufacturing is the combination of signal and power contacts: the birth of the *har-flex*® Hybrid. Thus, compact and versatile connectivity solutions can be implemented that are ideal for miniaturised PCBs. *har-flex*® Hybrid PCB connectors are available in straight and angled versions, so they can be used in applications with parallel boards (mezzanine), with extender cards, and in the motherboard-to-daughtercard configuration. You can save space and effort when using hybrid PCB connectors: They are ideal for modular IO systems and other miniaturised control applications.

- Simultaneous transmission of signals and power
- Reduced number of contacts saves space
- Many available contact combinations ensure outstanding flexibility



<https://b2b.harting.com/56114>

## ***har-flex*<sup>®</sup> Power**



In addition to the standard *har-flex*<sup>®</sup> in 1.27 mm pitch, the *har-flex*<sup>®</sup> product family also offers connectors in 2.54 mm pitch. *har-flex*<sup>®</sup> Power has been specifically developed for transmitting high currents from 18 A to 29 A. The modular production allows the flexible number of poles (from 2 to 12). Users can also choose between SMT and THR versions for the power contacts. *har-flex*<sup>®</sup> Power PCB connectors are available in straight and angled versions, so they can be used in applications with parallel boards (mezzanine), with extender cards, and in the motherboard-to-daughtercard configuration.

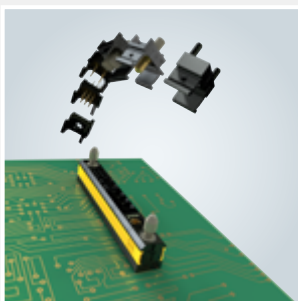
- Small, flexible and robust.
- Transmitting power in a small size
- Versatile scalable solution for individual requirements



<https://b2b.harting.com/56112>

# PCB connectors

**har-modular®**



This new innovative Connector system allows the designer to create a board-to-board connector exactly in line with his requirements. In the online configurator he can select the modules in quantity and order as needed, can download all necessary data and samples are available from a single unit.



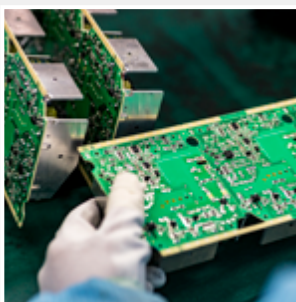
**CREATE YOUR OWN**

- Modules for Data, Signal and Power
- Connector length 20 to 172 mm
- Tested according to DIN 41612
- More than 1 billion different combinations
- Customer specific without tooling cost and tooling time
- Can be used on rolling stock, track side and in signal cabins
- Fire protection according to EN 45545-2: requirement sets R22/R23, HL 1, 2 and 3



<http://www.harting.com/har-modular>

## SEK Mezzanine



Until now, only cable-to-board connections were possible with SEK. These new female connectors for the PCB open up completely new applications for users of SEK connectors when using board-to-board connections. Mezzanine and motherboard-to-daughtercard applications can now also be implemented.

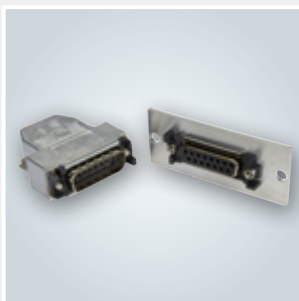
- Enables SEK Mezzanine and motherboard-to-daughtercard connections/applications
- 2.54 mm contact pitch with from 6 – 64 poles, as a supplement to DIN and *har-flex*®
- Many termination techniques: wave soldering, reflow soldering and press-fit connection
- Tape & reel packaging for the automated pick & place process



<https://b2b.harting.com/489560>

# Interface connectors

## D-Sub coding system



The new coding system for D-Sub is a safe way to prevent improper mating. Thus, it reduces downtime and repairs on the device. The robust mechanical coding is available for sizes 1 and 2. In addition to the 36 different mechanical coding variants, it provides an additional colour differentiation, which facilitates the assignment of different mating partners. Suitable for any D-Sub-based interface.

- Mechanical coding of size-1 or size-2 D-Sub connectors for reliable protection against improper mating
- Additional colour coding so the different mating partners can be visually differentiated.
- Can be used for front panel thickness from 1.6 to 2.0 mm
- Special screw bolts used to mount on the device side
- Suitable for all HARTING cable housings with 2 mounting slots



<https://b2b.harting.com/506833>

## HARTING ix Industrial® AWG 22



The AWG 22 variant of the HARTING ix Industrial® connector (according to IEC 61076-3-124) adds a third IDC option for connecting cables to HARTING's growing ix Industrial® portfolio. This product is particularly important for PROFINET applications. Since June 2021, HARTING's ix Industrial® type A is an official mating face for PROFINET applications. Thus, PROFINET users can now also benefit from the HARTING ix Industrial®. HARTING ix Industrial®: the future of miniaturised Industrial Ethernet.

- Miniaturised interface according to IEC 61076-3-124
- Transmission category: Cat. 6A / Class EA for 1/10 Gbit Ethernet
- EMC protected
- High packing density is possible
- Resistant to shock and vibration
- PoE / PoE+



<https://b2b.harting.com/09451812563XL>

# Interface connectors

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## HARTING ix Industrial® 90° angled



HARTING ix Industrial®: the miniaturised interface according to IEC 61076-3-124. The perfect solution when minimal installation space is available in Industrial Ethernet (type A) as well as for signals and serial BUS systems (type B). A 70% smaller device socket compared to the familiar RJ45: This saves valuable space in the device. The new angled cable connector now saves even more space outside the device.

- Miniaturised interface according to IEC 61076-3-124
- Transmission category: Cat. 6A / Class EA for 1/10 Gbit Ethernet
- EMC protected
- High packing density is possible
- Resistant to shock and vibration
- PoE / PoE+



<https://b2b.harting.com/09451812580XL>



## HARTING Mini PushPull ix Industrial®



Mini PushPull is the perfect IP65/IP67 housing for the HARTING ix industrial®. It combines the well-known advantages of HARTING's PushPull technology with the robust miniaturised Ethernet interface according to IEC 61076-3-124. The capabilities of the HARTING Mini PushPull ix industrial® interface are highlighted in industrial Ethernet (type A) as well as in signals and serial BUS systems (type B).

- IP65/IP67 miniaturised Ethernet data interface based on HARTING ix Industrial® and according to IEC 61076-3-124
- Connectors with IDC contacts that can be assembled in the field
- Transmission category: Cat. 6A / Class EA for 1/10 Gbit Ethernet
- Resistant to shock and vibration according to IEC 61373



<https://b2b.harting.com/55903>

# Circular connectors

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## HARTING UIC 558 connector



HARTING is expanding its wide portfolio for railway applications with two UIC-558-compliant interfaces (13 and 18 pole inserts) and an additional solution with a 22-pole insert + PE for the inter-car jumper. The new series of connectors is used to connect remote control and information cables on locomotive-hauled passenger trains. These lifelines for the rail vehicles are used to transmit signals and data. This enables, for example, remotely switched lighting, the opening and closing of doors, and the transmission of acoustic information or binary data packets.

- Complies with all relevant railway standards: IEC 61373 (Category 2), IEC 45545 (Class: HL3/R23) , UL-94 V-0
- High Flexible because compatible with UIC 558 standard
- Durable even under adverse weather conditions thanks to IP69 protection
- Outstanding installation safety ensured by the mechanical and visual coding
- A solution that is resistant to vibration and shock



<https://b2b.harting.com/46490>

## M12 SPE T1



For use in demanding environments, HARTING's T1 Industrial® interface is now also available in the familiar M12 format. The Single Pair Ethernet (SPE) technology achieves Industrial Ethernet transmission speeds of up to 10 GBit/s over only one twisted pair of wires. This saves space, resources and costs. Thinner cables and smaller connectors enable efficient Ethernet connections at the industrial field level. This makes the IIoT a reality and achieves TCP/IP communications all the way from the sensor to the cloud.

- Miniaturisation made possible by thinner cables
- Interface internationally standardised according to IEC 63171-6
- EMC protected
- IP65/67 protection
- Resistant to shock and vibration



<https://www.harting.com/node/18241>

# Circular connectors

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## M12 PushPull according IEC 61076-2-010



The IEC standard 61076-2-010 finally introduces an industry-wide uniform push-pull locking system for circular connectors. The slow screw-in process has become obsolete. Secure locking is achieved without checking the torque. The use of tools is not necessary. PushPull is the robust locking device for the railway environment.

- Time savings of more than 50 % compared to screw locking
- Miniaturisation: higher packing density because of tool-free PushPull assembly
- Safe handling: acoustic feedback ensuring safe locking
- Backwards compatible with conventional screw locking
- Reliable: IP65/67 protection
- Resistant to shock and vibration according to IEC 61373



<https://b2b.harting.com/411030>

## M12 S- & K-coding acc. IEC 61076-2-111



M12 circular connectors with K-coding provide up to 630 V and 12 A power supplies via a space-saving interface. This makes them ideal for supplying power to many devices and smaller drives. In addition to the classic screw locking, the M12 Power in K-coding is available with the tool-free PushPull locking that complies with the international standard IEC 61076-2-010.

- Transmits power up to 630 V, 12 A
- IEC 61076-2-111
- Available with PushPull locking according to IEC 61076-2-010
- Resistant to shock and vibration
- CE tested



<https://b2b.harting.com/09451511570>

# System Cabling

## M12 system cabling



M12 mating faces are established for Data and Signal transmission. Users can rely on IP protection, plug-in reliability, robustness, and EMC safety. Additionally, users can now benefit from a standardized PushPull locking system according to IEC 61076-2-010.

- Safe data and signal transmission
- EtherRail® cable acc. EN 45 545-2
- M12 system cabling with time-saving PushPull locking system and robust overmolding at the same time
- Mating faces with codes A, D, & X



<https://b2b.harting.com/459694>

## Han® S 200 system cabling



Featuring simple, fast and safe contacting, the Han® S 200 system cabling is the perfect termination for the front wiring on modular battery storage systems. These cabling solutions enable high power transmission with up to 200 A and 1500 V DC or 1000 AC. To eliminate the risk of improper mating there exists coloured variants that are additionally mechanically coded.

- Plug-and-Play solution reduces time and costs during the initial commissioning
- Reduced operating costs since no tooling, storage or labour costs are necessary
- Visible check of the locking status ensures safe installation
- Mechanical and coloured-based coding system
- Cable is resistant to heat, cold, UV, Ozone and acids
- Standards: EN 45 545-2, UL 1973, UL 9540, UL 4128



<https://b2b.harting.com/33506869250002>

# System cabling

## HARTING ix Industrial® to M12 X-coded panel feed through



The trend towards miniaturisation is omnipresent, demanding that objects, such as flat mobile devices, displays, controllers, cameras and sensors become smaller and smaller. With this panel feed through assembly based on a using HARTING ix Industrial® and M12 X-coded connectors, HARTING offers a solution that, on the one hand, follows the miniaturisation trend and, on the other hand, combines IP65/67 characteristics with the familiar M12 mating face of industrial applications.

- Adapter solution that enables transmissions from IP20 to the IP65/67 range
- Can transmit data up to 10 Gbit/s
- Easy assembly in a very compact installation space, thanks to the miniaturised ix Industrial® (type A) solution
- Can be combined flexibly with the standard screw termination technology or the PushPull locking system



<https://b2b.harting.com/484737>



# Customised Solutions

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## FO communication systems (FOCS) – expanded beam modules



WLAN on-board networks in trains require stable and interference-free networks, and this can be realized with fiber optic connections. These are very sensitive to soiling or even damage when the connection is disconnected and mated. With the help of HARTING lens modules, in combination with the Han-Modular® connector series, an insensitive and protected fiber optic plug connection can be realized

- More dirt-resistant optical data transmission through the use of beam-widening lenses
- Insensitive to electromagnetic influences
- Lower weight and required space compared to copper-based cabling
- High data rates up to 10 Gbit/s
- Vibration according to IEC 61373, Category 1 Class B
- Temperature -40° C to +85° C

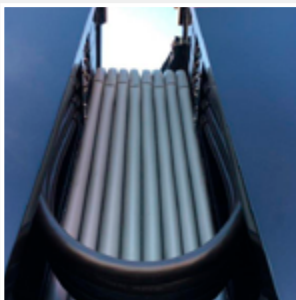


<https://www.harting.com/node/19067>

# Customised Solutions

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## Competence Center inter-vehicle jumper solutions



For inter-vehicle jumper connections, HARTING develops tailor-made solutions that meet individual requirements. As a solution provider of innovative components, consultant, service provider and system supplier, we accompany our customers into the digital future, from customer inquiry to series delivery.

- Carriage transfer systems adapted to individual requirements
- Complete engineering and design
- Joint development with the customer
- Individual simulations and tests by in-house accredited laboratory (ISO/IEC 17025:2018)
- Qualified consulting through worldwide network of experts
- Regional competence centres offer customized solutions



<https://www.harting.com/node/19453>

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