Customer Presentation (Innovation)

MX-DaSH Connector System

With vehicle package space always at a premium, the MX-DaSH Connector System combines power, ground and high-speed data, all in one convenient connector. This reduces weight, size and cost requirements; simplifies assembly operations; and supports the transition to zonal architecture.

PRESENTER'S NAME:

DATE:

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MX-DaSH Connector System

The MX-DaSH (Molex Data-Signal Hybrid) Connector System reduces weight, size and cost requirements; simplifies assembly operations; and supports zonal architecture by combining power circuits, ground circuits and high-speed data connections into one connector that can replace multiple traditional connectors in vehicle applications.

Key Product Information

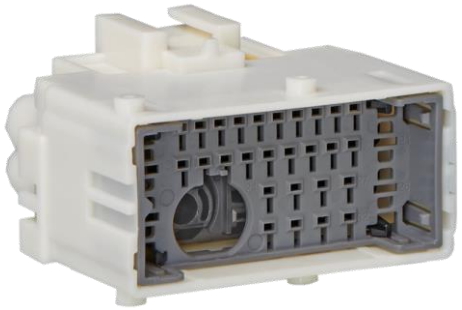
Category: Sealed or Unsealed Wire-to-Wire Connectors (Sealed or Unsealed Wire-to-Board Connectors available soon)

Power/Signal Terminals: 0.50, 1.20, 1.50, 2.80 or 4.80mm

Data Terminal: High-Speed FAKRA Mini (HFM®)

Circuits: Up to 31 (plus HFM® data)

Validation: Various USCAR, Peugeot and IEC specifications (varies by connector type)



View Product Landing Page

Download Wire-to-Wire Datasheet

New Series (Wire-to-Wire)

215958	**31+1-Way Female Receptacles and Male Blade Connectors (HFM®)**
300091	**10+2-Way Female Receptacles (HFM®)**
300092	**10+2-Way Male Blade Connectors (HFM®)**
300158	**10+1+1-Way Female Receptacles (HFM®)**
300159	**10+1+1-Way Male Blade Connectors (HFM®)**

Available Soon (Wire-to-Wire)

218342	**15+1-Way Female Receptacles (HFM®)**
218343	**15+1-Way Male Blade Connectors (HFM®)**
217901	**22+1-Way Female Receptacles (HFM®)**
217902	**22+1-Way Male Blade Connectors (HFM®)**

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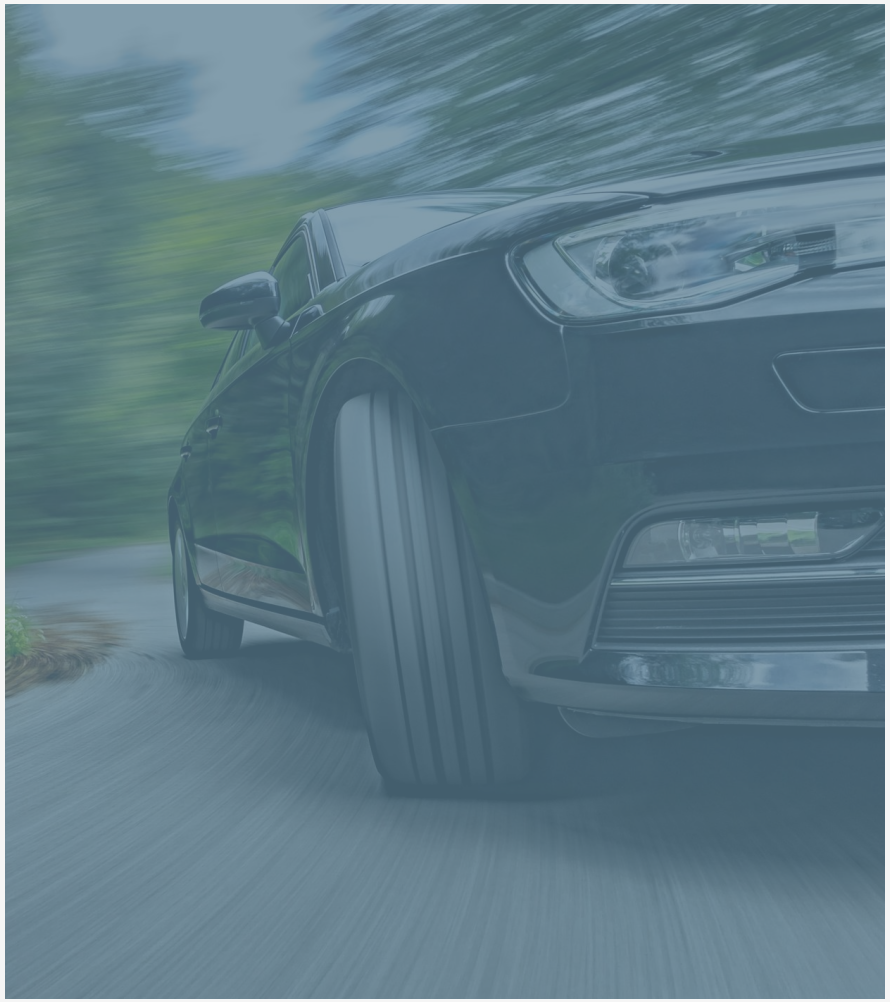
VITAL PRODUCT INFORMATION



How does this solution create value for our customers?

With vehicle package space always at a premium, the MX-DaSH Connector System combines power, ground and high-speed data, all in one convenient connector. High-speed data connections are often made using a singular connector alongside traditional power and signal connections. This high-speed connection must be individually routed in the vehicle, driving up bill of material (BOM) costs and process costs for the manufacturer. By combining these two circuit types into one connector, the electrical designer has more flexibility to package the MX-DaSH connector while lowering overall wiring costs. With wire-to-board connectors designed for automated assembly operations, the MX-DaSH system also helps lower assembly costs.

What makes this product different from the competition?

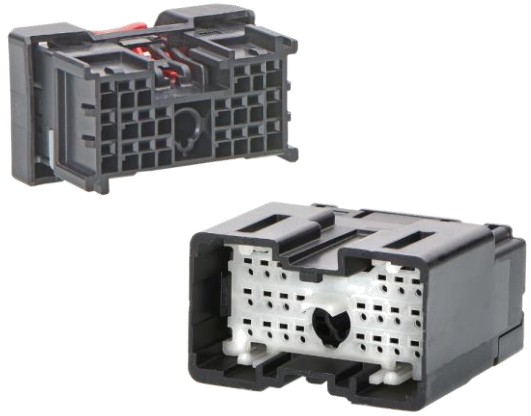
In addition to combining traditional power and signal circuits with high-speed data, Molex's new MX-DaSH Connector System incorporates industry-leading features such as male blade stabilization to protect male blades from damage during mating. There are also independent secondary lock features for improved terminal retention on both the male and female connector housings.

VITAL PRODUCT INFORMATION – WIRE-TO-WIRE OPTIONS

Sealed 10+2-Way and 10+1+1-Way Specifications	
Design	10+2-Way Connector, 10+1+1-Way Connector
Terminal Size	1.50mm (power and ground circuits) + HFM® < 1 Gbps
Circuits	10 x1.50mm, 2 x HFM® or 1 x 2.80mm + 1 x HFM®
Validation Specifications	USCAR2 rev8 USCAR17 rev5 USCAR49 T2/V1/S2

Unsealed 31+1-Way Specifications	
Design	31+1-Way Connector
Terminal Size	1.20mm/2.80mm (power and ground circuits) + HFM® < 1 Gbps
Circuits	19 x 1.20mm (0.75mm^2), 8 x 1.20mm (1.50mm^2), 4 x 2.80mm, 1 x HFM®
Validation Specifications	B217050 revE (Peugeot) IEC 62153-4-3:2013 (E) IEC 62153-4-7:2015

Unsealed 22+1-Way Specifications	
Design	22+1-Way Connector
Terminal Size	1.20mm (power and ground circuits) + HFM® < 1 Gbps
Circuits	22 x 1.20mm, 1 x HFM®
Validation Specifications	USCAR2 rev8 USCAR17 rev5 USCAR49



Sealed 15+1-Way Specifications	
Design	15+1-Way Connector
Terminal Size	1.20mm (power and ground circuits) + HFM® < 1 Gbps
Circuits	15 x 1.20mm, 1 x HFM®
Validation Specifications	GMW3191 T2/V1/S3 USCAR2 rev8 USCAR17 rev5 USCAR49

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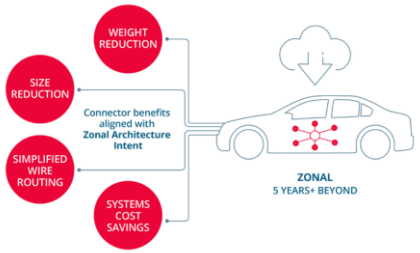
PRODUCT OVERVIEW

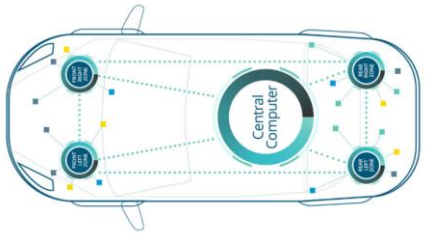
Optimized connectivity for zonal architecture

MX-DaSH connectors are designed for compact connectivity in an electronic control unit (ECU) controller/computer. Instead of taking up precious real estate with multiple connectors, engineers can meet multiple connectivity needs by using one compact connector.



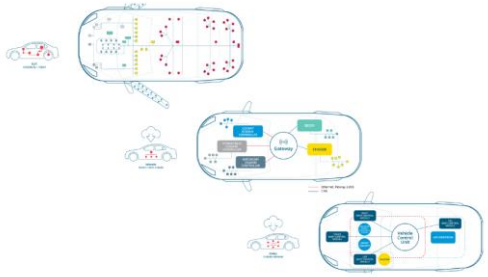
Sealed and unsealed wire-to-wire and wire-to-board hybrid signal connectivity capability

Multiple options provide compact, hybrid connectivity for a range of automotive applications needing high-speed signal transmission for both in-cable and zonal architecture applications. For example, the 31+1 wire-to-wire solution combines 31 power and ground circuits and a data connection, providing compact connectivity to ECU controllers/computers.



Adopting new techniques

The connectivity between a device and a zonal gateway requires a new generation of hybrid or mixed connectors that can carry both power and high-speed signals, even in the tough conditions found on the road. With greater functionality packed into every single MX-DaSH connector, harness installation is also considerably easier, as fewer connection points need to be made.



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MARKETS AND APPLICATIONS

Autonomous Driving Modules

Camera Systems

GPS Devices

Automotive

- Autonomous driving modules
- Computing modules
- Camera systems
- Gateway/switch modules
- GPS devices
- High-resolution displays (4K displays)
- High-speed cable networking
- Sensor-device connectivity
- Surround-view cameras
- LiDAR devices

Commercial Vehicle

- GPS devices
- Infotainment devices

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FREQUENTLY ASKED QUESTIONS

What is the validation standard used for MX-DaSH?
Validation standards differ between different types of MX-DaSH connectors. Validation standards met by one or more MX-DaSH connectors include GMW3191 T2/V1/S3, USCAR2 rev8, USCAR17 rev5, USCAR49 T2/V1/S2, B217050 revE (Peugeot), IEC 62153-4-3:2013 (E) and IEC 62153-4-7:2015.

What are the high-speed cable types used in the MX-DaSH connectors?
Cable types are dependent on customer demands. The current line of MX-DaSH connectors has been validated to:

- HFM® – RG-174, RTK031
- H-MTD® – LEONI DACAR 686-3/76000176# (241A10746R), GEBAUER & GRILLER K9305 (241A12089R)

Are MX-DaSH wire-to-board headers available?
Wire-to-board headers compatible with the MX-DaSH system are currently in development but are not yet available.

SOLVING INDUSTRY CHALLENGES

Industry Need	Industry Challenge	Industry Solution	Anticipated Results
Small package size	Ever-increasing usage of automated driver-assist features and high-speed circuits in vehicles is driving the need for more and more single-circuit data connections.	MX-DaSH eliminates the need for stand-alone single-circuit connections and combines this high-speed connection with traditional power and signal circuits.	The combination of power, signal and high-speed circuits in one connector will give electrical system engineers greater flexibility when designing new wiring systems.
Low-cost solution to high-speed data connections	Today's high-speed data connections are predominantly made with single-circuit connectors that are packaged alongside power and signal connections.	The combination of high-speed data and traditional power and signal circuits into one connection system reduces the need for extra single-circuit connections and reduces the cost of the entire electrical system.	Engineers are always tasked with cost-reduction initiatives. By incorporating the MX-DaSH Connector System into their electrical designs, they can reduce costs and improve process efficiency.
Connectivity for zonal architecture	As automotive designs evolve to include zonal architecture, engineers will need connectivity solutions that can manage multiple interfaces and functions while taking up minimal space in limited real estate.	Molex has developed a solution that meets zonal architecture requirements. The MX-DaSH system is designed for compact connectivity to an electronic control unit (ECU)/computer.	Instead of taking up precious design real estate by using multiple connectors, engineers can meet multiple connectivity needs within one compact connector.

SOLVING INDUSTRY CHALLENGES (CONT'D)

Industry Need	Industry Challenge	Industry Solution	Anticipated Results
High reliability for wire-to-wire connection systems	For newly developed connector systems, there are some design features that are crucial to ensuring a consistent connection every time.	MX-DaSH wire-to-wire products feature industry-leading male blade stabilization and independent secondary locks to ensure that terminals mate properly.	The addition of these new connector features gives the design engineers greater confidence that these circuits will be properly mated 100% of the time, helping ensure reliable operation.
Design flexibility for wire-to-board connection systems	The cost of engineering resources to make design changes reduces profitability. As wiring architectures change to meet consumer demands for more functionality, the architecture must adapt to meet networking requirements.	The modular design of MX-DaSH wire-to-board connectors offers several form factor options with interchangeable modules integrated inside the MX-DaSH header.	These modules allow engineers to future-proof their architecture designs, enabling the header to meet changing networking requirements without having to change the form-factor/footprint on the ECU.

PRODUCT ADVANTAGES AND FEATURES

Optimizes wiring harness by combining multiple connectors into one connector

The design incorporates power, signal and data connections using 0.50, 1.20, 1.50, 2.80 and 4.80mm terminals as well as High-Speed FAKRA Mini (HFM) modules for high-speed data transmission.

Delivers reliable operation in harsh conditions through the available T2/V1/S3-rated sealing and the mat seal

The mat seal eliminates the need for individual cable seals, providing reduced package size and reducing the cost of connectors subject to harsh conditions inside or outside the cabin.

Ensures secure mating and reliable connectivity

Features include an available independent secondary lock (ISL), pin protection plate (PPP) and blade protection.

Eases implementation and incorporation into designs

Using complete assemblies for male and female housings minimizes assembly operations.

Prevents mis-mating and minimizes assembly errors

Six unique keyways are available to ensure proper orientation.

Key Specifications	
Configurations	Sealed or unsealed wire-to-wire and wire-to-board designs
Terminal Sizes	0.50, 1.20, 1.50, 2.80, 4.80mm
Data Connections	HFM®, H-MTD®
Validation Specifications (Depends on Connector Variant)	USCAR2 rev8 USCAR17 rev5 USCAR49 GMW3191 2019 B217050 revE (Peugeot) IEC 62153-4-3:2013 (E) IEC 62153-4-7:2015 T1/V1/S1 (unsealed) T2/V1/S3 (sealed)

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UNIQUE AND USEFUL DIFFERENTIATION VS. TRADITIONAL PRODUCTS

	Traditional Connector System	Molex | MX-DaSH Connector System
Implementation	Instrument panel and body control harness and module	
Number of Connectors	8	**2**
Copper Wiring	-	**~6.0m reduction**
Plugging Operation Time	-	**~75% reduction**
Module and Harness Image		

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SPECIFICATIONS AND SUPPORTING INFORMATION

MX-DaSH Wire-to-Wire Connectors

Reference Information

Packaging: Bulk pack

Female Receptacles/Male Blade Connectors:
- Housing – up to 31 circuits + data
- Terminal –1.20mm or 1.50mm (power or signal), or 2.80mm (power)
- Data – HFM® or H-MTD®

Wire Sizes for Terminals:
- 1.20mm terminal – 0.35 to 1.50mm^2 wire
- 1.50mm terminal – 0.50 to 1.50mm^2 wire
- 2.80mm terminal – 2.00 to 2.50mm^2 wire

Mating Requirement: Keyed pair

Designed in: Millimeters

RoHS: Yes

Mechanical

Terminal Retention Force with Independent Secondary Lock (ISL): 100N (min.)

Mating Force (max.): 70N

Unmating Force (max.): 70N

Electrical

Voltage (max.): 250V

Current (max.): Refer to derating curve

Insulation Resistance: 100 Megohms (min.)

Physical

Housing: Polyamide (PA66)

Contact: Tin

Vibration Environment:
- Acceleration Rate – 9G (88m/sec^2)
- Frequency – 20 to 200 Hz

Sealing Performance (Sealed Versions):
- Initial – 50kPa (min.)
- After Endurance Test – 30kPa (min.)
- High-Pressure Washing Test – IP69K

Operating Temperatures: -40 to +120°C or -40 to +85°C (varies by connector type)

Additional Resources	
Web Overview Page	**https://www.molex.com/en-us/products/automotive-connectivity/automotive-pcb-wire-connectors/mx-dash-connectors**
Datasheet	987652-5672.pdf (molex.com)
Global Product Managers	John King, TSBU, TIS (Wire to Wire) Marcelino Hernandez, TSBU, TIS (Wire to Board)

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