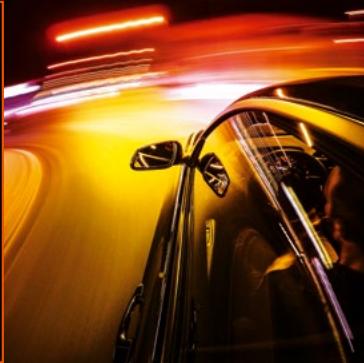


# ● CONNECTION SYSTEM

## Off-The-Shelf Product Portfolio



Apitv is moving mobility forward with safer, greener and more connected solutions.



Satisfying various industry demands and moving commercial & specialty vehicle architecture to the next generation.



• A P T I V •

# At Aptiv, we are born to move

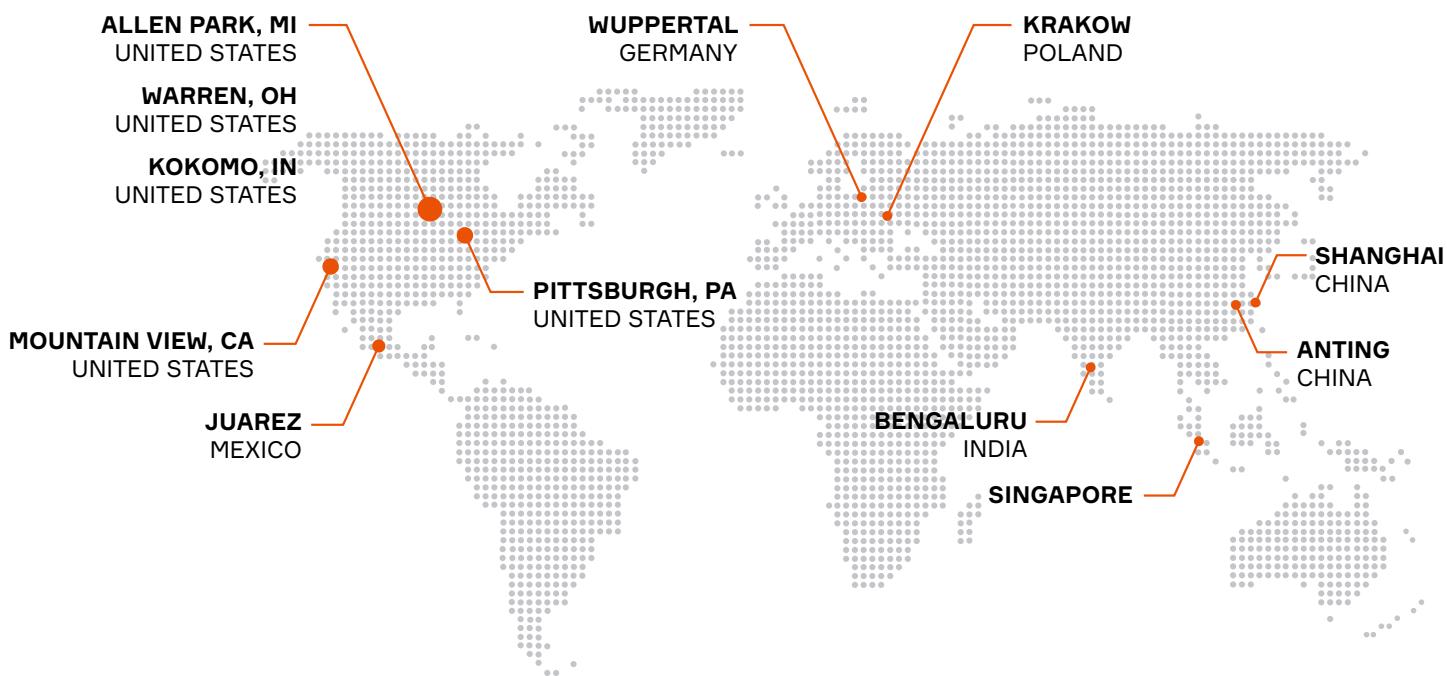
Aptiv is a **global technology company** that develops safer, greener and more connected solutions enabling the future of mobility.

Headquartered in Dublin, Aptiv has approximately 150,000 employees and operates 14 technical centers, as well as manufacturing sites and customer support centers in 45 countries.

**VISIT APTIV.COM**



## Major Design Centers Worldwide





# The world of transportation

**Aptiv has been a trusted automotive supplier for decades, introducing practical innovations in the areas of safety, efficiency, and connectivity.**

**The transportation market has been advancing in these areas and Aptiv can offer product solutions designed for the tougher operational and environmental requirements.**

Commercial and recreation vehicles are often exposed to higher levels of environmental forces, including vibration, dust, water, debris, and temperature. To protect the integrity of the electrical system, high performance connection systems are required.

To deliver superior performance, a number of complex factors in the electrical system must be addressed in the component design, including sealing, locking features, and materials.

# CTCS

## CONNECTOR TYPE

A complete portfolio of connectors, accessories, covers, terminals, seals, and hand crimp tools

- Inline and device applications
- 2 through 62 way configurations
- Sealed and unsealed applications
- Slider lock and Lever lock assist mechanisms
- Housings using CTS 1.5, 2.8, 6.3 mm terminals

## TYPICAL MARKETS

Commercial, construction, agricultural, and marine vehicles

## TYPICAL APPLICATIONS

- Suitable for harsh environments
- Cab, chassis, engine compartment, and on-engine applications
- Ideally for connections in a vehicle sheet metal firewall pass-through location



## FEATURE & BENEFITS

- Interchangeable with other industry terminals and housing
- Mounting flexibility: panel, strap/clip, and bracket
- Improved vibration resistance: up to 30G sine, 20Grms random 330 hrs./axis and robust back shells
- High temperature ratings: up to -40 to +140°C
- Additional connector shielding for protection against debris ingress
- Tin, silver, and gold plating options for terminals
- Offered in both non-V0 and V0 materials

# APEX



## CONNECTOR TYPE

- In-line sealed connectors
- APEX 150 (1.5 mm) housings: 10, 14, 16 way
- 24 and 55 way ErgoMate™ housings
- APEX 2.8 mm housings: 2, 3, 4, 6, 10 & 14 ways

## TYPICAL MARKETS

Commercial, construction, agricultural, and marine vehicles

## TYPICAL APPLICATIONS

Suitable for harsh environments

## FEATURE & BENEFITS

- High performance in-line connectors for vibration, high temperature, moisture or harsh assembly environment
- Fulfill USCAR and other OEMs' performance specifications
- 2-piece APEX terminal technology
- Clean Body Terminal design friendly to mat seal
- No polarization needed
- Tin, Silver and Gold plated versions available
- Temperature range: -40 to 155 °C degree

# HES

## CONNECTOR TYPE

- Circular connector size 24 shell
- Terminal patterns
- 19, 21, 23, 29, 31, 47, 50 and 60 way Headers
- Terminals: 1.0, 1.6, 2.4 mm

## TYPICAL MARKETS

Commercial, construction, military, marine, and agriculture vehicles

## TYPICAL APPLICATIONS

- Ideally for connections in a vehicle sheet metal firewall pass-through location
- Intended for use in any high density, in-line application

## FEATURE & BENEFITS

- Terminal designed for lower insertion forces
- 3-rib design provides better sealing capability up to 50% compared to existing designs
- Environmentally sealed to IP68
- Robust, specialized finger design virtually eliminates terminal unseats
- Fully interchangeable with industry standards terminals and connections
- Frontward/backward compatibility
- Rugged construction to withstand harsh environments
- Sonic welded design provides 360 degrees of contact to withstand high vibration to meet J-2030 standards
- Validated to SAE J-2030 and various other customer specifications



# DCS Power Sealed



## CONNECTOR TYPE

Solutions for power interconnection using 2.8mm, 4.8/5.6mm and 9.5mm DCS Power terminals with 2, 3, 4 ways

## TYPICAL MARKETS

Commercial, construction, agricultural, and marine vehicles

## TYPICAL APPLICATIONS

Cooling fans, air conditioning, electrical power feeding

## FEATURE & BENEFITS

- Connector position assurance (CPA - 2 ways)
- Terminal position assurance (TPA)
- User friendly with integrated secondary lock device allowing for detection of unseated terminals
- Easy and quick connection system with terminal guiding system
- Circumferential interface sealing and single wire sealing
- Mechanical coding

# OCS

## CONNECTOR TYPE

- In-line sealed and unsealed connectors
- Terminals: 0.64, 1.2, 1.5 and 2.8 mm

## TYPICAL MARKETS

Commercial, agricultural, and marine vehicles

## TYPICAL APPLICATIONS

Suitable for body & engine & cockpit compartment applications

## FEATURE & BENEFITS

- Robust design features for enhanced warranty performance and designed-in durability
- Clear and consistent audible click
- Enhanced strain relief for blocked cavity configurations
- Thumb grip incorporated to aid connector unmating
- USCAR indexing
- Cavity compatible with industry standard terminals
- Validated to USCAR-2 Class III and other OEMs' specifications
- Small package size
- Optional CPA
- Standard mating interfaces
- Interchangeability with other compatible systems in the market



## SICMA Mini-Sealed



## CONNECTOR TYPE

- High sealing performance in-line connectors using SICMA/GTS 1.5 mm terminals
- 2, 3, 4, 5, 6 ways
- 6 way hybrid SICMA 1.5 & 2.8 mm

## TYPICAL MARKETS

Commercial, construction, agricultural, and marine vehicles

## TYPICAL APPLICATIONS

Suitable for body, engine compartment and harsh environment applications

## FEATURE & BENEFITS

- High sealing performance ensured by rear block/mat seal and circumferential interface seal
- Optimized size with 3.33 mm pitch for 1.5 mm terminals
- Reduced size sealed housing
- Easy and quick connection system with locking principle
- Integrated secondary lock feature (TPA) allowing detection of unlocked terminals
- Terminal Position Assurance (TPA)
- Optional Connector Position Assurance for 2 and 6 ways (CPA)
- Optional wire back covers

## SICMA Inline Unsealed Connector

## CONNECTOR TYPE

2 & 6 way connectors using SICMA 1.5mm terminals, 24 & 36 way connectors using 1.5 & 2.8 mm terminals

## TYPICAL MARKETS

Transportation vehicles

## TYPICAL APPLICATIONS

Harness Sectioning in Cockpit, Dashboard and interior connections

## FEATURE & BENEFITS

- Reliable harness sectioning, inline connection solution
- Compact male and female housings which provide a convenient inline wire to wire solution
- Mixed sizes of 1.5 & 2.8 mm terminals populating 24 and 36 way connectors



## SICMA Sealed Full Interconnect



## CONNECTOR TYPE

- 6 & 24 way –mixed size of 1.5 & 2.8 mm Sicma terminals
- 56 way – 1.5 Sicma terminals
- Sicma Terminals: 0.64, 1.5, 2.8mm

## TYPICAL MARKETS

Commercial, construction, agricultural, and marine vehicles

## TYPICAL APPLICATIONS

Engine management with gas converter, automatic gear box management, body control modules

## FEATURE & BENEFITS

- Market standard, foot print interface to device headers
- Sealed Interconnection from harness wiring to an electronic equipment
- Wire to Electronic Printed Circuit Board (PCB) in order to build electronic control units

# CMC

## CONNECTOR TYPE

- Full interconnect sealed solutions for engine management solutions using 0.64 and 1.5 GTS terminals
- CMC (Computer Modular Connector) is one of the most popular interfaces for Engine Management Electronic Control Units:
- 32, 48, 64 & 112 ways

## TYPICAL MARKETS

Commercial vehicles, construction, agricultural, marine vehicles

## TYPICAL APPLICATIONS

- Suitable for harsh environments
- Powertrain Electronic Control Units

## FEATURE & BENEFITS

- Accepts reversible wire dress cover
- Right or left mountable rotating lever for mate assistance
- 15 g sinus vibration resistant with Tin terminals
- 1.5 Bar pressure proof sealing
- 45° & 90° wire bundle exit through back shell covers



## SICMA Panel Through



## CONNECTOR TYPE

- Connector solutions for Door to Body connections using SICMA 1.5 and 2.8 mm terminals connector solutions
- 14, 16, 24, 33, 34, 42 and 50 ways

## TYPICAL MARKETS

Commercial, construction, agricultural, and marine vehicles

## TYPICAL APPLICATIONS

Particularly suitable for door to body or engine to cockpit pass-through applications

## FEATURE & BENEFITS

- Suitable for a combination of low and medium current applications
- Mating assistance system with slider to minimize mating force and allowing blind mating
- Male terminals can be protected from hazardous damage of male blades thanks to a front grid protection
- Optional back shell cover

## Lamp Connector

### CONNECTOR TYPE

- HIR2/HB3/HB4 sealed
- PG18.5 sealed & unsealed versions
- PG20 sealed version
- PGJ19 sealed version (H8, H9 and H11)

### TYPICAL MARKETS

Vehicles lighting, Indicator lamp

### TYPICAL APPLICATIONS

Fog Lamps, Daytime running lights

## FEATURE & BENEFITS

### PG18.5 & PG20

- Easy unmating thanks to robust rear latch
- Housing locking principle
- Front Terminal Position Assurance (TPA)



### PGJ19

- Safe mating and unmating thanks to robust and protected front and rear latch
- Housing locking principle

### APEX HIR2

- Built around High-Performance APEX 2.8 Terminal System HIR2 mates to standard industry bulbs of the increasingly popular halogen infrared variety

## Sensor Connector



### CONNECTOR TYPE

- DCS SensoMate 2.8 mm sealed 2 and 3 way
- HDK 1.2 2 way
- ATS (DSQ) 4 and 5 way
- APEX SensoMate 1.2 mm sealed 2, 3, 4 and 5 way
- APEX SensoMate 2.8 mm sealed 2 and 3 way
- GTS SensoMate 2 and 3 way

### TYPICAL MARKETS

Commercial, construction, agricultural, marine, and transportation vehicles

### TYPICAL APPLICATIONS

Fuel injector, actuator, pressure sensor applications, distance and radar sensor

## FEATURE & BENEFITS

- High vibration resistance
- Single wire sealing
- For heavy duty diesel engine applications
- Terminal position assurance (TPA)
- APEX SensoMate compliant to USCAR guidelines
- HDK and APEX 1.2 complies with AK 1.2 / USCAR 120
- High temperature: T3=125°C (HDK and GTS up to T4=150°C)

# High Voltage – Auxiliary Device Solutions (up to 1000V)

## CONNECTOR TYPE

- **On-Board Charger:** Header and inline unshielded connectors
- **PTC heaters, AC compressors and inverters:** Shield-Pack HV280 & Apex HV280 2 way, AK class1 2 & 3 way

## TYPICAL MARKETS

Commercial, construction/agriculture, recreational, and marine vehicles

## TYPICAL APPLICATIONS

A/C compressor, heater, coolant control module, on board charger, DC converter, battery accessory output

## FEATURE & BENEFITS

### Multiple currents depending on customer applications

- On-board charger – 32A at 85°C
- Shield-Pack HV280 – 40A at 85°C

### Multiple shielding principles:

Bundle shielding, Individual shielded cables, Multi-core shielded cables

### Secured connection features

- Connector Position Assurance (CPA) and Terminal Position Assurance (TPA) for superior connection reliability
- Integrated interlock for safe disconnection

### Robust vibration performance in harsh environments



# High Voltage – Power Conversion Solutions (up to 1000V)



## CONNECTOR TYPE

### Batteries, eMotors & inverters:

RCS 800/890 2 way connectors; Metal and AK Plastic pass-through 1 to 3 way; HV890 AK Class4 2 way

## TYPICAL MARKETS

Commercial, construction/agriculture, recreational, and marine vehicles

## TYPICAL APPLICATIONS

Inverters, drive motors/generators, and high current/high voltage battery outputs

## FEATURE & BENEFITS

### Multiple currents depending on customer applications

- RCS800/890 – 210A at 85°C

### Multiple shielding principles:

Bundle shielding, Individual shielded cables, Multi-core shielded cables

### Secured connection features

- Connector Position Assurance (CPA) and Terminal Position Assurance (TPA) for superior connection reliability
- Integrated interlock for safe disconnection

### Robust vibration performance in harsh environments

# Low Voltage Solutions (12-48V)

## CONNECTOR TYPE

### Power Pack 1000

- High current sealed connectors 1 and 2 ways
- Inline and device (right and straight angle)

## TYPICAL MARKETS

Commercial, construction/agriculture, and recreational

## TYPICAL APPLICATIONS

- High current wiring harness inline
- High current device application and sealed pass-through panel mount system

## FEATURE & BENEFITS

### Current carrying capability:

- 145A at 85°C
- Silver-plated Power Pack 1000 multi-contact terminal system

### Secured connection features

- Connector Position Assurance (CPA) and Terminal Position Assurance (TPA) for superior connection reliability

### Multiple configurations:

- 1 way and 2 way inline connections with both straight and right orientations
- 2 way wire-to-device connections with straight and right angle cable exits

### High sealing protection:

- IP67 rated



# Charging Solutions



## CONNECTOR TYPE

### Vehicle Charging Inlets

- AC inlets : SAE J1772/Type I, Type II, GBT
- DC inlets : Combo 1, Combo 2, GBT

### AC Charge Connectors (Type I, Type II and GBT)

- Mode 3 cable assemblies
- Mode 2 charge couplers

## TYPICAL MARKETS

Commercial vehicles such as trucks and buses, recreational vehicles

## TYPICAL APPLICATIONS

- AC & DC Vehicle charging interface according to regional standards (SAE J1772/Type I, Type II, GBT)
- Charging cable assemblies to connect charging stations to vehicles
- Portable Electric Vehicle Supply Equipment (EVSE) for grid-to-vehicle charging

## FEATURE & BENEFITS

### High reliability field proven solutions

- In serial production at multiple automotive OEMs
- Time tested products performing in real life environments for example on roads

### Products qualified against demanding automotive requirements

- Certified according to multiple regional standards (CE conformity, UL certified, GBT certified)
- Detailed automotive PPAPs based on comprehensive lab tests above industry standards

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