

design Modular connectors outperform hardwiring

FAQs

FREQUENTLY ASKED QUESTIONS

WHAT IS A MODULAR CONNECTOR?

It is one where power, signal, and data can be combined into a single connector rather than separate connections. The connector handles different signal types through the combination of different modules that the designer selects. Modules can also be used to accommodate nonelectrical media such as connections for air lines and fiber optics in the same device as electrical connections.

WHAT KIND OF MACHINE AUTOMATION APPLICATIONS WOULD REPLACE HARDWIRED CONNECTIONS WITH A MODULAR CONNECTOR?

The typical justifications for modular connectors include reduced installation and maintenance costs. They can be particularly compelling for machines or processes produced for multiple installations. A truism for modular connectors is that the **connector pays for itself the first time it is disconnected**. Modular connectors also find use when space is tight partly because their rectangular shape typically can handle more contacts than similarly sized circular connectors,

HOW DOES THE CONFIGURATION PROCESS FOR A MODULAR CONNECTOR BEGIN?

The designer begins either with the electrical schematic or with a knowledge of the number and kinds of cables that the connector must accommodate. Both the makeup of the connector and its location typically also depend on where in the enclosure the connector

conductors will go. Other factors that affect the connector design include the need for locking and the degree to which there's a need for water-tight performance.

IS THERE A MAXIMUM OR MINIMUM PHYSICAL SIZE FOR MODULAR CONNECTORS?

There is no maximum size but most modular connectors are normally less than 2 in. wide by 3-6 in. long. It is possible to find larger connectors but usually only for specialized applications such as handling high amperage conductors in locomotives and energy storage and generation. Typical connectors are in the 5 × 3-in. range. The smallest modular connectors are generally about an inch square and generally handle only a few conductors.

IS THERE A MAXIMUM NUMBER OF CONDUCTORS THAT MODULAR CONNECTORS CAN HANDLE?

It is physically possible to accommodate 300 24AWG wires or 216 14-gage wires in a modular connector. But it is exceedingly rare to see this sort of device. Most applications use connectors handling between four and 50 conductors for electrical conductors that are 22-gage or larger.

WHAT KIND OF CONNECTIONS CAN MODULAR CONNECTORS HANDLE?

It is common for modular connectors to contain small signal wiring and power connections. Fiber optic connections can be built in as well. And frequently, pneumatic lines



are combined with electrical connections in modular connectors.

WHAT ARE THE LIMITS ON THE CONNECTION PARAMETERS?

Industrial connectors typically don't carry specs for high-frequency signals but they can handle signal frequencies that characterize mainstream industrial processes. Most connectors are rated for 600 V but special models can handle voltages up to about 5 kV. Similarly, there are connector models that will accommodate conductors carrying hundreds of amps. For air connections, connectors can handle air pressures of 116 psi at most through quarter-inch-diameter hose.

WHAT KIND OF QUALITY STANDARDS APPLY TO MODULAR CONNECTORS?

UL and cUL standards apply for safety and environmental ratings. DIN standards govern crimping, spacing, and other internal electrical qualities of the connector. But there are no standards governing the mating interface. HARTING is the inventor of the modular rectangular connector and has set

the interface industry standard for modular connectivity.

WHAT DETERMINES WHETHER A CONNECTOR NEEDS A LOCK?

If the connection must be physically strong, the mating devices may need to be held together with screws. In some applications a quick release is important, and push-button style disconnects will often work well. Still other connectors can be outfitted with one or two levers, typically attached to the housing, for clamp down. The lever position can take into account where there is free space available for hand access.

CAN CONNECTORS BE WATER TIGHT?

Most connectors are rated IP65, meaning they withstand water jetted at them for at least three minutes at 1,000 kPa. If need be, connectors can be made with ratings of IP67 or IP68 which means they stand up to immersion of up to 1 m and 2 m respectively for an hour.

CAN CONNECTOR HOUSINGS BE PLASTIC OR METAL?

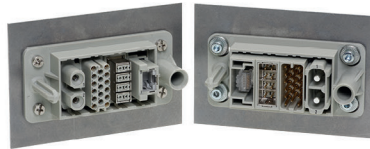
Connectors that must have IP65 or IP67 ratings are available in plastic or metal. Connectors requiring an IP68 rating are metal and are fastened together via screw or toggle locking designs. Connectors with pushbutton disconnect also must be metal. Most metal connector housings are powder-coated aluminum. But housings can also be stainless steel for washdown applications or zinc where the housing must not spark when touching other surfaces. Plastic housings are fiberglass-reinforced resins and may be lighter and somewhat less expensive than metal versions of the same connector.

ARE THERE SPECIAL FACTORS THAT BEAR ON CONNECTORS THAT COMBINE DIFFERENT SIGNAL TYPES?

Typical factors resemble those used to ensure signal fidelity on printed circuit boards. For example, when shielded cable terminates in the connector, the connector should carry the shield through to the mating side. This type of practice is important when power signals are in close proximity to low-voltage signals.



Pushing Performance



Han-Modular® docking frame -

The Han-Modular® docking frame makes it possible to create a modular blind mate connector without a housing. This type of connector is needed in cabinet applications such as switch cabinets.



Han-Modular® -

With the HARTING Han-Modular® series, users can assemble their 'own' connectors according to their own individual requirements. Essentially creating a "custom" connector using standard stocked modules.

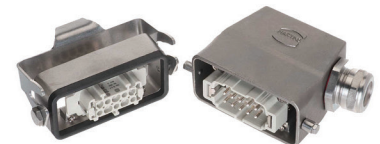
Han-Eco® -

The Han-Eco® Modular Hoods and Housings are a lightweight, economical, corrosion-resistant alternative to the metal hoods and housings used in tough industrial environments.



Han-Yellock® -

Han-Yellock® is flexible, offers utmost safety, reliability and is offered with indoor and outdoor versions and requires practically no tools for assembly. It unburdens highly complex technical components by utilizing existing modular offerings. Reducing the size or in some cases eliminating the need for small junction boxes is possible by including terminal block functionality and bridging within a connector.



Han-INOX® -

The Han-INOX® series made of high-grade stainless steel has been introduced for applications in areas such as the food & beverage and processing technology industries.

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