

Design Solutions

SOFTWARE, MATERIALS AND COMPONENT SOLUTIONS FOR THE DESIGN ENGINEER



LET'S TALK ETHERNET CONNECTIONS

with Murrelektronik

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Let's talk Ethernet connections

There is undoubtedly an on-going shift towards the use of Ethernet for industrial control and automation applications. Ethernet's data transfer performance has advanced to the point that it is increasingly replacing proprietary communications at the plant floor level and in some cases moving downward into the cell and field levels. As a manufacturer of electrical control system components, **Murrelektronik** offers a comprehensive, advanced connector programme for industrial networking applications



Connectors include 360° shielding, extremely compact housing and an improved clip

INDUSTRIAL ETHERNET CONNECTORS FOR A HIGHLY DIVERSE RANGE OF APPLICATIONS AND INDUSTRIES

Murrelektronik manufactures a wide range of industrial Ethernet connectors. No matter if they are used in IP20 cabinet wiring, in a harsh industrial IP67 environment, or from the cabinet or the office world into the field, the cables can be produced in almost any length, with a choice of connector style (0°, 90°, 45°) and connector angle (left, right, up or down). Any of these combinations can be ordered in quantities as small as one piece. The cables feature 360° shielding to ensure reliable data transfer, the compact housing saves space and the

RJ45 connector clip has been refined to be easier to work with and to install. Murrelektronik's industrial Ethernet connectors are available to meet Cat.5, Cat.5e, Cat.6 and Cat.6A specifications. All Murrelektronik industrial Ethernet connectors are 100 per cent tested before they leave the factory. This means they are electrically tested for high voltage, function, pinning and short circuits, as well as visually inspected to guarantee quality and reliability.

M12 CONNECTION TECHNOLOGY FOR STATE-OF-THE-ART INDUSTRIAL ETHERNET APPLICATIONS

According to the DIN EN 61076-2-101 standard, the D-coded M12 connectors meet these requirements easily. With 100 mating cycles, IP65/ IP67, and a shock resistance of 50g, it became a standard in industrial Ethernet. Using Murrelektronik's prewired and moulded M12 connectors prevents wiring errors and is tamper-proof. The D-coded pin design reliably prevents mistakes caused by wrong connections. A 15° locking mechanism gives protection against shock and vibration and the 360°



Industrial Ethernet range

IP20 CABINET LINE TO IP67 FOR HARSH INDUSTRIAL ENVIRONMENTS

The harsh industrial environment at device level (sensor/actuator) requires industrial Ethernet system components to be robust. While IP20 protection (standard RJ45 connectors) is sufficient for components at the office level, the industrial level requires IP65/IP67 protection. Of particular importance is the high quality of the plug connections. These have to operate reliably against shock, vibration, humidity, EMC problems, temperature fluctuations and aggressive media.



RJ45 Cabinet Line (field installation)

shielding of Murrelektronik's M12 connectors ensure reliable data transfer, even under extreme conditions.

FULL SPEED ON THE DATA HIGHWAY

If the data quantity is higher, for example with high-speed vision systems, X-coded M12 connectors according to E DIN EN 61076-2-100 are the right choice. Four separately shielded data pairs that are separated by an X-shaped metal cross, guarantee proper data transfer up to 10Gbit (ISO/IEC 11801 Cat. 6A). Murrelektronik offers the X-coded M12 connectors with a highly flexible PUR cable. This makes them suitable for moving applications.

Combining RJ45 connections in the office and X-coded M12 connections in the field makes it possible to establish a consistent gigabyte communication company wide.

HYBRID CABLES – PARALLEL TRANSFER OF DATA AND POWER

With the Y-coded M12 round plug connector, Murrelektronik offers another interesting variant for industrial Ethernet applications. This hybrid solution makes it possible to transfer power and signal together in a single connector. The metal Y-coding separates the four power contacts from the four signal contacts in the pin design. This makes it possible to transfer 100Mbit/s, while at the same time providing 2 x 6A power connections. The installation effort in these applications is reduced, which enables cost savings. To meet all the requirements of the field level, Murrelektronik relies on a PUR cable that is suitable for C-track applications.

For industrial Ethernet, selecting a suitable cable material is as important as choosing the right connector. For each application, a specially designed cable is available. If the wrong cable type is used, cable failure (such as wire break) can occur in a very short time and the complete installation may fail.

For static applications, cost-effective type A cables with a PVC jacket are recommended. For flexible applications, type B cables with a PUR jacket are the right choice, with an especially good price and performance ratio. For dynamic applications, where cables are exposed to constant torsion or continuously moving drag chains, a highly flexible type C PUR cable is required. Additionally, it has to be taken into account that an Ethernet cable that is suitable for C-track applications is not a torsion cable, and a torsion Ethernet cable is not suitable for drag chains. It is also very important to pay attention to the minimum bend radius. Using a small radius will destroy the cable.

Murrelektronik offers the right cable for every application. To ensure a maximum lifetime, decisive criteria regarding the application has been defined. For example, minimum bend radius, degree of torsion, bend cycles and other parameters. This has been confirmed in many tests. Murrelektronik's industrial Ethernet cables are resistant to external interference, which is ensured by the visual shielding of at least 85 per cent together with the 360° shielding concept of the connector. This enables stable and proper data transfer.

Murrelektronik offers a comprehensive product range for industrial Ethernet as a standard program, complemented by user-specific and customised versions. The right cable is available for all application specific protocols that were developed on the same physical basis, such as Profinet, Powerlink, EtherCAT. Shielded M8 connectors have been

established for EtherCAT, SERCOS III can be recognised by its special red Cat.5e cables, suitable for drag chains. The AIDA work group (Automation Initiative of German Automobile Manufacturers) defined the push pull power and push pull data connectors (copper and optical fibre) as standard for Profinet.

Appropriate interface modules, such as flange connectors or cable entry systems, and the corresponding bus cables – sold by the metre from 100m to 500m – complement this product range and all cables are UL-approved. The cables are suitable for Fast Connect and can easily be pre-wired with the Fast Connect tool.

With experience from many different industries and a comprehensive product range, Murrelektronik is a strong partner for companies that want to create consistent networks based on industrial Ethernet.

Murrelektronik.uk
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Y-coded M12

