



HIRSCHMANN

A **BELDEN** BRAND

Capability Bulletin

CB 1001HE

Sustainable Solutions

Directly and indirectly, the Belden® range of Hirschmann™ products makes a significant contribution towards a greener future. In this bulletin we highlight our commitment to global sustainability.



Hirschmann™ is committed to the sustainable use of finite resources and the preservation of our natural environment for the well-being of future generations

- **Reducing energy consumption**
- **Investing in ecological solutions**
- **Focus on alternative energy**

Environmental Management

Belden company policy clearly states that our business is committed to operating in an environmentally responsible way: "Belden will comply with all applicable environmental, health and safety laws and regulations in every country we do business." Compliant to this policy, we use natural resources as sparingly as possible, and we aspire to environmentally friendly solutions, both in the application of our products and our production processes and facilities.

To this end, our production facility in Neckartenzlingen, Germany, has been certified for environmental management in accordance with ISO 14001 since October 1998.

Doing More to Use Less

Throughout our processes, we carefully record our use of water, waste-water and energy consumption. Measuring enables us to determine the key users and helps us to take the correct technical and organizational measures. Waste products are sorted and collected separately by type and, where applicable, passed on for recycling.

Since 1998, we have been working hard to keep our plant energy consumption as low as possible. Based on climatic and daylight factors, we regulate our lighting and the heating, which is generally gas-operated. To ensure maximum effectiveness, the roof of our production area was insulated in 2008, and at the same time new skylights were installed with high-quality insulating glass. This resulted in a significant saving of around 50% of energy used for heating purposes.

In 1992, we already introduced a special release process for the procurement of substances. In this way, we ensure that all substances are tested with regard to their effect on the environment. And of course we meet all the stringent requirements of both REACH, and RoHS.



Consistently making products greener



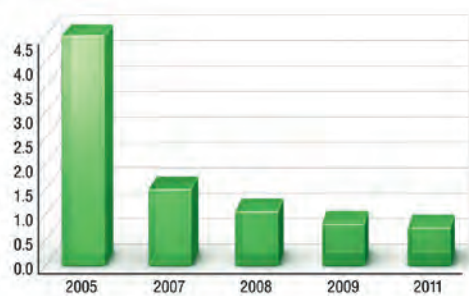
HiTech Research and Development

Hirschmann's R&D facility uses the latest specialized test equipment and simulation tools – and is located at our production location, so we can avoid costly and unnecessary transport, production and redesign costs, whilst at the same time reducing our carbon footprint. We minimize our environmental impact further by using professional development tools and processes.

In the early stages of product development, we look at ecological aspects such as energy and resource consumption as well as product's future disposal. We set out to constantly reduce the energy consumption of our products. To achieve this we use the latest innovations such as new chip technology, thus creating more efficient devices, saving on energy consumption, whilst at the same time offering enhanced features. By applying higher circuit integration density, our products are able to offer a greater degree of functionality per watt.

We only use materials that meet – or exceed – legal regulations and the specific needs of our customers.

Energy Consumption



Power consumption (W) per transmission (Gbit/s)

During the product development phase, we always consider the ecological impact of our products. This includes their performance according to REACH, RoHS, and where possible we choose for low-energy design, and the development of re-usable modules.

Reduction of CO2 emissions is achieved through fewer re-designs, because we use state-of-the-art parts, as well as EMV and



temperature simulations to optimize our designs. Using our own HiTech test and measuring facilities, we save on transportation – and our fully automated measuring equipment reduces testing time, and saves energy.

Achieving Production Efficiencies

Our lean approach to production drives us to identify waste and find new and more efficient processes for the future. As we manufacture exclusively on customer demand, we only expend material and energy on products which have already been ordered. This means no gratuitous devices will be produced, reducing stock and avoiding unnecessary waste.

By strictly applying our continuous lean improvement process, we reduce material and energy consumption to a minimum, meeting the requirements of green production. Other savings are achieved by having our own on-site mold-shop so that we do not have to transport half-finished parts and by ensuring that up to 98% of our packaging materials are reusable.





Key Hirschmann™ Product Families

A Clear Product Strategy

We set out to make the products we manufacture both durable and modular, offering users maximum flexibility. Because they are built to last, our products do not need to be replaced quickly – and thanks to ongoing software improvements they can be kept up-to-date for longer – avoiding the need for further investments and/or replacements.

Our products and systems can be controlled from a remote location, reducing the need to localize applications – reducing CO₂ emissions.

MICE Family with a Wide Range of Media Modules

The MICE family offers a modular approach to industrial Ethernet, providing scalability, and flexibility, accommodating a variety of different media and connectors. MICE switches are highly flexible and future-proof – replacement investments can be delayed for longer, saving raw materials and energy. Their scalability and flexibility also help to reduce transport and production costs (reduction of CO₂ emissions).

OpenRail Family

Rail Switches enable flexible network design, use minimum cabinet space, and can be adapted to suit all network topologies. The “OpenRail” approach makes it possible to assemble switches that meet exact customer specifications – so that we only produce what is really needed – saving resources and avoiding waste.

MACH100 with Different Modules

The MACH100 is primarily designed for the control room. Using the modular variants, end devices can be networked together with exactly the right number of copper and fiber ports. MACH100 Switches can be used in temperatures between 0°C and 50°C and deliver high quality and durability. Using the latest technologies, these switches are cost-effective and they currently use less than 50% of the energy used by standard office switches.

MACH1000 Family

MACH1000 is a rack mounted managed switch featuring extreme resilience to EMI/RFI, and suited for environments with high electric fields and discharge, such as power and substations as well as railways. These switches

are virtually indestructible and are suitable for new installations and retrofit of existing substations where ambient temperatures can be extremely high. Hirschmann™ applied the latest technology to dramatically lower their energy use – so they can be used in temperatures of up to 85°C without cooling or air-conditioning.

RSR Family

When the going gets tough for DIN rail switches (i. e. shock, vibration and temperatures fluctuating between -40°C and +85°C), the rugged RSR Hirschmann™ rail switches deliver the performance you need. They have a compact metal housing and can be mounted both on DIN rails and on the wall. Hirschmann™ applied the latest technology to dramatically lower their energy use – so they can be used in temperatures of up to 85°C, without cooling or air-conditioning.

OCTOPUS Family

The OCTOPUS family of IP67 industrial Ethernet switches provides both a budget priced unmanaged switch, and managed switches with the same functionality as OpenRail, in an IP67 enclosure. OCTOPUS provides a solution for mounting network switchgear in the field in harsh conditions. These switches are suitable for use in Transport (E1), trains (EN 50155) and ships (GL). They can be installed without a rack – so less material is used – saving on CO₂ emissions through reduced transportation and production efforts.

BAT Family

The Hirschmann™ BAT Family includes a broad portfolio of Access Points and Clients that work seamlessly together, for maximum mobility, flexibility and network availability in today’s industrial environments. Wireless means fewer cables – when using PoE all that is required is just one Ethernet cable – saving on cables and raw materials.

MACH4000 Family

MACH4000 is a top of the range network switch with Layer 3 Routing and up to 10Gbps capability. With 48 port capacity in 8 port modules, MACH4000 is the ultimate backbone switch for mission-critical applications. With high port density and a highly customised configuration including Layer 2 and 3 control, the 19” rack mount MACH4000 switches use less than 0,0025 Watt per Megabyte routing speed.



MICE Family



OpenRail Family



MACH100 Family



MACH1000 Family



RSR Family



OCTOPUS Family



BAT Family



MACH4000 Family



A Strong Track Record: Projects in Renewable Energy

Expertise and Specialism

In addition to its well-established product range, Belden offers a wide range of vendor independent services, that help you to design and implement an economical end-to-end solution for your network. From consulting, to training or support – the Belden® Competence Center is able to deliver a tailor-made service from a single supplier.

Through our structured network planning process, we are able to reduce the amount of material used. We help to avoid over-specification, so that networks are not too big or too complex for their specific function – thus avoiding waste. At the same time, optimization during the operating phase ensures this performance will be maintained, even when conditions change.

Whichever technology you use, our experts will support you all the way. Thanks to our specialist know-how, we are able to help you develop, install and operate the most effective and energy efficient solution. Up-to-date manufacturer's expertise, an international service network and fast access to external specialists guarantees the best possible support.

The Right Certification

Hirschmann™ has an integrated management system which covers DIN ISO 14001 Environmental Management System as well as DIN ISO 9001 Management System. In line with this, we also require our suppliers to be certified accordingly.

In addition, we have been approved in accordance with the IRIS International Railway Industry Standard. This certification exceeds the general prerequisites of the ISO 9001:2008 Standard by meeting the stricter requirements of the Railway Industry. Having adopted the IRIS standard

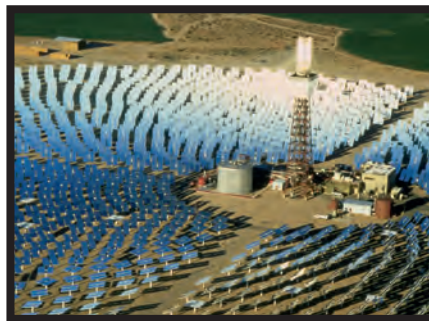
throughout our organization has improved our ability to handle long-term and complex projects. All our standards are requalified by 3rd party audits.



As a business, we achieve around 10% of our company's turnover with renewable energy companies. In fact, Hirschmann™ products and know-how have been applied in many sustainability projects. Our experience includes:

Thermosolar Projects

The technological evolution in solar energy and the increased price of fossil fuels allows for medium to long term competitive solutions for thermo solar plants or hybrid plants with other fossil or renewable sources of energy. Hirschmann™ has been at the forefront of these developments, helping operators of these projects to manage and control the installations with advanced Ethernet solutions.



Wireless LAN in Windfarms

Wind is globally one of the fastest growing ways to generate energy, on-shore and off-shore. Hirschmann™ has been involved from the start, providing switches and wireless solutions, facilitating more (cost) effective operations. Applications range from transmission of telemetric data to video monitoring of windfarms, whilst the introduction of the latest WLAN-Standards makes it possible to even network outlying farms. Hirschmann™ is able to offer complete solutions for wind energy providers from one source.



Railway Applications for Secure and Future-proof Investment

Public Transport is widely accepted to be more environmentally friendly than other transportation modes. With more and more people using the train, tram or bus, passenger comfort, safety and security of rolling stock and terminals are critical. Ethernet networks offer many opportunities to deliver these qualities to the transport systems. Not only in new developments, but also in existing infrastructure and trains, which can be retrofitted without the need to replace existing cabling. Wireless offers further opportunities, such as an excellent solution for coupling trains.

