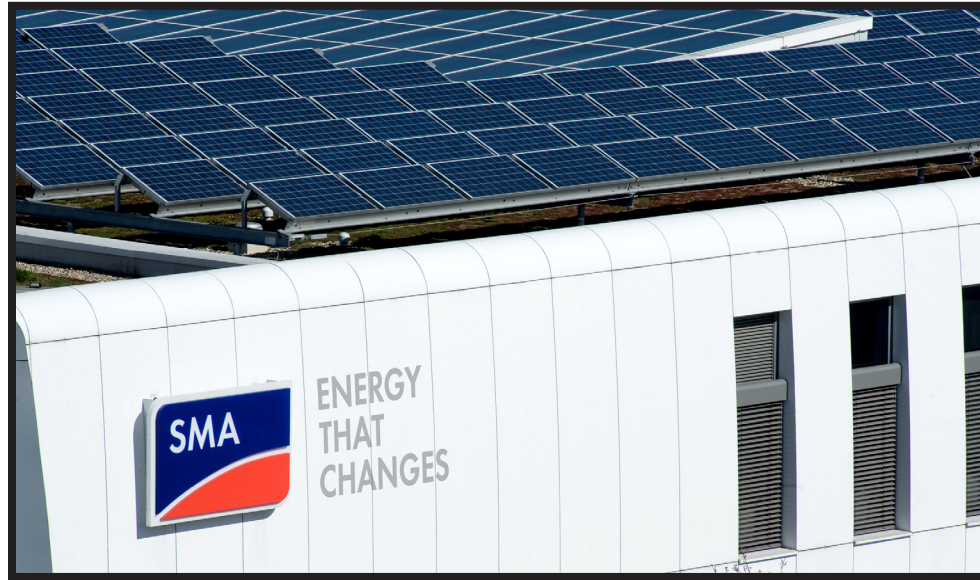


Case Study

CS00006

MIPP – The Industrial Termination and Patching Solution That Helps Ensure Safe, Accurate Monitoring in Solar Power Plants

SMA Solar Technology AG relies on communication within photovoltaic power plants using the Modular Industrial Patch Panel (MIPP), the industrial termination and patching solution from Belden.



SMA Solar Technology is the leading global specialist for high-efficiency photovoltaic system technologies and solar inverters for every system size, all performance classes and for every requirement. Specializing in energy management photovoltaic systems, the company provides innovative technologies for future energy supply structures – regardless of the type of solar modules used.

The portfolio allows comprehensive monitoring of power generation and fulfills all necessary requirements of park operators to provide ongoing services. The power spectrum of SMA ranges from technical consulting, engineering and project management to a comprehensive service for photovoltaic power plants around the world.

Project Details

The MIPP is an integral part of the solutions used by SMA Solar Technology for photovoltaic power plants, which are characterized by maximum economy and efficiency. In addition, SMA provides its customers a worldwide service network with more than 80 locations for all necessary network services.

The MIPP connects with Hirschmann industrial compact managed Ethernet switches and power plant controllers used in the field with individual devices. This provides a reliable Ethernet based communication and cabling platform to ensure safe and accurate monitoring and control of power generation. The compact patch panels deliver one solution for structured management of fiber or copper-based communication and control cables that connects the individual mirrors to a string. MIPP's versatility facilitates possible changes or extensions of the communication network within solar parks and brings costs down.



MIPP Copper Patch Panel Single Module



MIPP Fiber Splice Box Single Module

**Be certain.
Belden.**

The Installation's Key Challenges

- Reliable adjustment and monitoring of solar modules for maximum profitability of photovoltaic power plants
- Precise monitoring of the power outcome
- Continuous offering of network services to the power plant operators
- Minimizing errors during commissioning
- Reduced downtime during operation and service
- Maximum protection of solar modules through extensive status information and fastest correction of string failures
- Easy, faultless and safe installation

The Installation's Key Benefits

With the robust industrial housing, narrow design and the possibility to meet potential new requirements of the installation by simply swapping the modules, flexible and economic PV power plants can be realized.

- **Flexibility:** communication infrastructure can be changed at any time quickly.
- **Cost reduction:** Installation and commissioning require less time.
- **Reliability:** Network services are continuously available.
- **Profitability:** Service quality and service times are improved and shortened.
- **New markets:** Special approvals and conformity enables worldwide use.

Why Belden?

With Belden's MIPP, SMA Solar Technology found a solution that meets the highest requirements for photovoltaic power plants. In addition, the patch panel provides an excellent price-performance ratio, fast delivery times and global availability.

To meet SMA's high demands, the MIPP works together with the Hirschmann compact managed Ethernet switches which are an ideal and reliable solution for park control and surveillance.

SMA cited extensive support from Belden during the planning and installation phase – specifically in the area of Ethernet-based communication systems. This includes a complete communication infrastructure for power plants, the patch panels, copper and fiber optic cable, connectors, ruggedized switches and wireless systems – all of which were supported by Hirschmann's network management software.

The three industrial-strength MIPPs include:

- MIPP Fiber Splice Box
- MIPP Copper Patch Panel
- MIPP Mix– where termination of both fiber and copper cables is required

SMA Solar Technology uses two single modules, each with six optical duplex ports for SC connectors or four RJ45 ports for shielded Cat-5e cable in Keystone format.

Splice trays as well as special guiding elements and high-quality contacts ensure a safe and cost-effective installation. The housing design allows quick and flexible installation on a DIN rail or a wall. Maintenance has been simplified, allowing

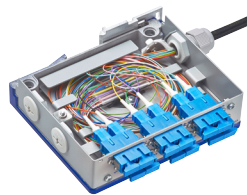
the modules to be individually removed without dismantling the MIPP from the initial installed unit. The MIPP ensures maximum system reliability in performance-critical applications.

Product Details

- **Robustness:** durable UL certified (UL 1863) solution for linking Hirschmann switches to Belden cabling with a guaranteed lifetime of well over 10 years and temperature range of -20°C to +70°C
- **Versatility:** suitable in nearly any industrial application where fiber splicing, copper termination or both are required. A single MIPP allows for termination and patching of:
 - up to 72 fiber cables: MIPP Fiber Splice Box
 - up to 24 copper cables: MIPP Copper Patch Panel
- **Ease of use:** mounted on a DIN rail or wall, any module can be individually extracted from the housing for maintenance actions.
- **Future proof:** simply swap modules to meet new network demands or add blind modules at initial installation.
- **Save space and cost:** high port density and multiple cable entry points.



MIPP Fiber Splice Box



MIPP Copper Patch Panel



MIPP Mix

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