

Easily up the mountain


Up to 800 people per hour can be transported from Stechelberg station to Mürren with the new cable car, which is the steepest in the world. Not only the tourists, also their luggage and bags must be transported to the village. To ensure that this transport runs smoothly, containers can be attached directly to the cable car cabins as required. The automation company Bürki Electric is responsible for the automation solution for the attachment process. Part of the operating concept is the handheld operating safety panel from SIGMATEK.

Andreas Leu

The Schilthorn (2,970 meters above sea level) in the Bernese Highlands (Berner Oberland), with its popular Piz Gloria panoramic restaurant, is almost a must-see for tourists from Switzerland and abroad. When there are perfect

weather conditions with clear sky you can marvel the Alpine world, especially the majestic backdrop of the mountains Eiger, Mönch, and Jungfrau, while enjoying your lunch or a snack. Therefore food and drinks have to be transported to the

summit to cater for guests. Especially foreign tourists also have luggage with them to stay overnight in the car-free town Mürren. This transport is carried out using specially designed containers that are attached to the cable car cabins to



With a maximum gradient of 159.4 %, the new cable car from Stechelberg to Mürren is considered the steepest cable car in the world.



Picture: Lion Communication

Marcel Pecka explains the various functions of the HGW 1033-3 portable wireless control panel to Stephan Mack, sales engineer at SIGMATEK (Switzerland).

Small panel, big impact in freight logistics

The wireless safety control panel from SIGMATEK combines freedom of movement, safety, and user-friendliness in a compact design. The 10.1-inch multi-touch display allows intuitive operation of the application. The integrated 7-segment display clearly shows which part of the system the HMI is safely connected to. An actively illuminated emergency stop button indicates that the safety function is available and the safety system is correctly integrated. Safety-relevant data is transmitted to the safety controller according to the black channel principle. With this solution, the device achieves safety level SIL 3/PL e, Cat. 4.

Mürren. The gastronomical items are then transferred to two Funifor cable cars and taken to the summit via the Birg station.

As part of the 'Schilthornbahn 20XX' project, the new Stechelberg-Mürren cable car connection went into operation in December 2024. This section is home to the world's steepest aerial tramway, with a maximum gradient of 159.4 %. In less than four minutes, the cable car climbs 775 meters in altitude over a distance of 1.194 meters. The project required freight logistics for which Derap AG was responsible. For the design and implementation of the automaton solution the company commissioned Bürki Electric AG, based in Steffisburg, which is also a

system partner of SIGMATEK Switzerland. Bürki Electric took care of the entire engineering process, from planning and creating the schematics to switch cabinet construction, programming, and commissioning.

Docking containers safely and easily

"A container for the Schilthornbahn weighs approximately 950 kg and can transport a maximum of 2.500 kg of goods," explains Marcel Duppenthaler from the Schilthornbahn. "We usually receive them already weighed and labeled; however we have our own scales to ensure that the maximum weight is not exceeded. The entire process of filling and

docking the container takes only a few minutes, which perfectly meets our requirements."

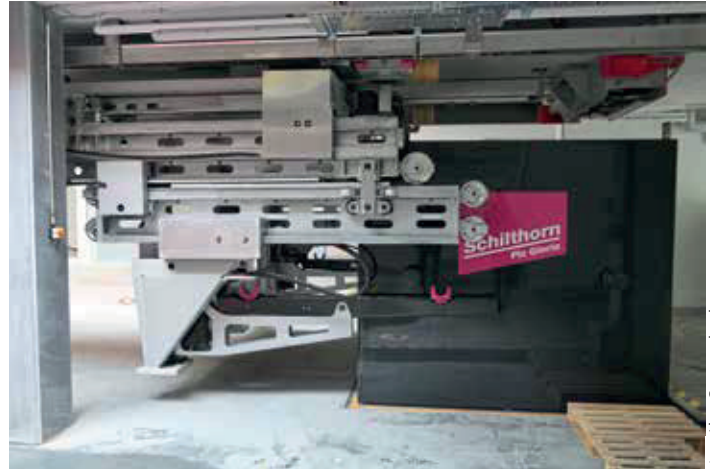
How does the process of attaching a container to the cabin work? Project manager from Bürki Electric Marcel Pecka, explains: "The automation is implemented with a Siemens control system, because this is where we have the most expertise. The logistics staff uses the handheld control panel from SIGMATEK to safely operate the process. The big advantage of the mobile panel is that it has all the required safety functions and is connected to the control system via WLAN. This allows the operator to move freely in the space under the cabin and

« The advantage of the mobile SIGMATEK control panel for this project is that it integrates all safety functions and allows the system to be operated via WLAN. »



The process of docking a container to the cable car cabin.

Picture: Lion Communication



Picture: Lion Communication



Picture: Lion Communication



Picture: Lion Communication

control the processes."

In the solid mechanics for docking a total of seven servo axes are installed: one for the lifting and one for the rotating movement of the container, the longitudinal drive, two for extending the telescope under the cabin, and for the longitudinal extension and clamping jaws for cabin centering. All of them move point-to-point, except for the telescopic drives, which are synchronized with each other as linear movements. Electric cylinders are installed to lock the container to the cabin.

Safe and convenient operation of the process

"The entire operation of the container attachment process is controlled in a

Schilthornbahn 20XX project

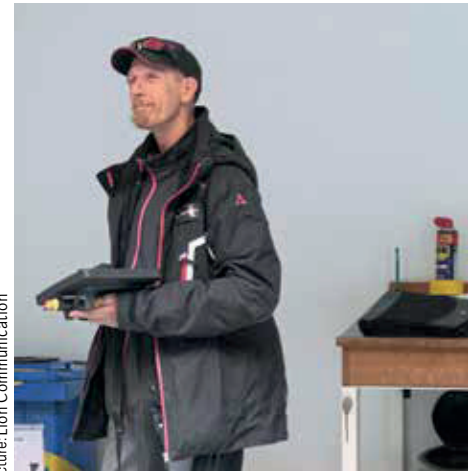
The Schilthornbahn 20XX project involves a cable car that connects the Stechelberg valley station with the Mürren intermediate station and can transport up to 800 people per hour. Logistics for goods and luggage will be automated on this route. From Mürren, two Funifor cable cars will reach the Birg and Schilthorn stations. A uniform architectural design for the new buildings was developed in collaboration with the Federal Office of Culture, the cantonal monument preservation authority, and Berner Heimatschutz.

semi-automatic mode via SIGMATEK's handheld operating panel," explains Marcel Pecka. "It has all the required safety elements and functions such as emergency stop, confirmation switch, and key switch. The individual process steps can be carried out by the operating personnel, only when the confirmation switch is pressed, which is extremely important from a safety perspective. The key switch is used to activate service mode, in which all axes can be moved individually in jog mode or approached via the entered absolute position."

To connect the wireless panel to the higher-level system control, Bürki Electric installed SIGMATEK's SRO 021 safety relay output cards in the control cabinet and linked them to the PLC via two channels.



Picture: Lion Communication



Picture: Lion Communication

Marc Dupenthaler from the Schilthornbahn has a lot of freedom of movement thanks to the wireless safety panel.



Picture: Lion Communication

A clear display of all important status messages for the process on the mobile panel.



Picture: Schilthornbahn AG

Concept image of the cable car cabin with attached container.



Picture: Bürki Electric

Each axis can be moved individually during service operation.

For visualization, the mobile operating unit was connected to the local panel via VNC (Virtual Network Computing). For this purpose SIGMATEK offers a ready-made software module. “However, there were initial problems with parameter entry for this connection,” remembers Marcel Pecka. “Together with the parent company, SIGMATEK Switzerland provided us with quick and uncomplicated support. The keyboard template was adapted to the specific application so that the entries could be made. Since then, the entire system has been working flawlessly.”

Mobile safety panel practically unrivalled

“Needless to say, that we would have been thrilled to equip the entire system with our automation solution, especially because

we also have all the components such as control, visualization, and drives available. However, that’s just how the specifications are,” regrets Stephan Mack, responsible for sales in central and western Switzerland at SIGMATEK. “With this project, we were able to prove that we can also provide support for such applications to ensure that the system functions flawlessly. This is particularly important in safety-critical projects such as this one of the Schilthorn cable car. Our mobile WLAN control panels are often a ‘door opener’ for new customers, as there is hardly anything comparable on the market in terms of price-performance ratio.”

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System partner Bürki Electric AG
 Since 1974, Bürki Electric has been a reliable partner for automation, control systems, switchgear, and engineering. With around 40 employees, the company implements individual projects from the initial assessment of customer requirements to smooth commissioning, including support and maintenance of the system. Teamwork is a top priority at Bürki Electric. It is characterized by flat hierarchies, team spirit, and a family-like working atmosphere. In addition, women make up almost 30 percent of the company's workforce, which is unusual for a technical company.