TECHNICAL**INFO**

The **LEITNER Station**

LEITNER ropeways


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The **LEITNER Station**

Variable modular design

Through its individual integration into nature, each ropeway station is unique. Therefore, finding the right balance between standardisation and variability is one of the key challenges when designing a ropeway station. The modular design of the LEITNER station meets these demands perfectly. In order to make boarding and deboarding of high-performance gondola lifts more comfortable, the station is extended by up to 5 m. This not only adds more space but, first and foremost, more time for relaxed and convenient boarding.

The LEITNER HCL station was developed to meet these demands for chairlifts as well. This station provides very high boarding comfort at maximum passenger capacity by optimally coordinating the courses of movement of the chair and the passenger.

For installations with very little available space, the LEITNER station can be delivered in a version shortened by 3 m. Without any restrictions in terms of passenger comfort, this solution is very space-saving and also very competitive in terms of cost-efficiency.

A grip-coupling system certified according to the EU ropeway directive, which is standard for all LEITNER stations, prevents the vehicle from exiting the station in case of false coupling. The safety section after the station exit can be omitted, and the towers close to the station can become considerably lower. In some cases, using the system even means that entire towers in the vicinity of the top station can be omitted.

High-quality steel components, slow-burning synthetic materials, a broad range of monitoring and safety features as well as its modern, attractive design complete the concept of the LEITNER station.

The **Short LEITNER Station**

Space-saving and economical

Basis

The short LEITNER station is the perfect solution for chairlifts with little space available in the area of the station and/or for short detachable systems.

Description

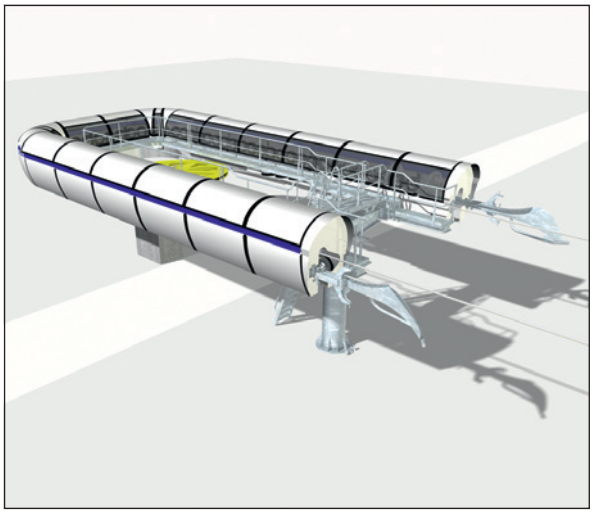
Through the omission of one station module, the modular station concept of the LEITNER station facilitates the construction of a design which is 3 m shorter than the standard station.

The short LEITNER station is equipped with a cost-efficient low station covering and applied in combination with a standard-length drive-tension station.

If the short station is applied as a deboarding station, the deboarding speed is somewhere between 1.3 and 1.5 m/s. This is much lower than with fixed-grip systems and therefore its operation is absolutely trouble-free.

The short boarding station is designed as a 90° boarding system, which means that a comfortable station speed of 1.0 m/s can be achieved.

The short station is also equipped with the certified grip-coupling system and all other safety features of the standard station.



Benefits

The short LEITNER station is the **optimal solution** for detachable systems with **little space available** in the area of the station.

Due to the cost **advantage** over the standard station, the short station offers a very interesting **alternative to fixed-grip systems** from an economical viewpoint as well.

Technical data

Station configuration	Fixed return station (bottom or top station) for detachable 4-seater or 6-seater chairlifts in combination with a drive-tension station
Station dimensions (station covering)	Length x width CD4: 16.1 x 7.8 m CD6: 16.5 x 8.6 m
Station covering	Low covering, colouring according to customer request
Station turnaround velocity	Approx. 1.3–1.5 m/s as deboarding station Approx. 1 m/s as boarding station with 90° boarding system

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The **Long LEITNER Station**

Comfortable boarding with gondola lifts

Basis

The challenge with modern gondola lifts with ever-increasing transport capacities is to allow for a comfortable boarding and deboarding even when there are very short time intervals between the vehicles and many passengers are on the platform.

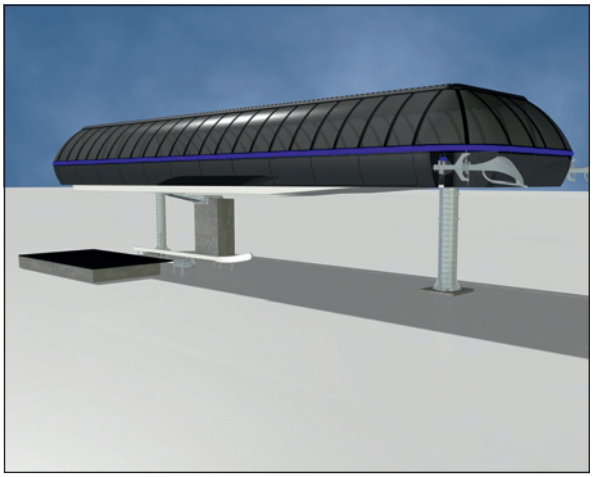
Description

By installing another station module, the standard station can be extended by 2.5 to 5 m. This means that the length of the platform is extended by up to 10 m, which in turn means that there is not only more space, but also more time available for the gondola in the station turnaround.

In this way, the time that the gondola remains in the station turnaround can be increased by up to 50 % as compared to the standard station.

In order to fulfil the static requirements, the 5-m version of the station is equipped with an additional steel bracket which is installed in the area of the station curve.

The long LEITNER station can be operated in any station configuration (drive, return or drive-tension station) and can be equipped with a high or low station covering.



Benefits

Stress-free passenger boarding/deboarding thanks to more space available on the platform and longer travel times of the gondola in the station.

Through simultaneous **reduction of the station turnaround velocity**, boarding becomes even **more convenient** and **safer** and the **ride comfort** is **improved** even further.

Disturbance-free passenger **boarding/deboarding** reduces downtimes and significantly **increases the availability** of the installation.

Technical data

Station configuration	Drive station (drive frame movable by 2 m) Return station (max. lorry travel 5 m) Drive-tension station (max. lorry travel 3 m)
Station dimensions (station covering)	Length x width 2.5-m extension: 26.7 x 8.6 m 5-m extension: 29.2 x 8.6 m
Station turnaround velocity	Adaptable to project specifications upon customer request, can be reduced to 0.2 m/s

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The **LEITNER HCL Station**

High-capacity loading – high-comfort loading

Basis

While gondola lifts can easily be optimised in terms of boarding comfort by making the station longer, chairlifts require an optimal coordination of the courses of movement of the chair and the passenger in order to achieve the same improvement.

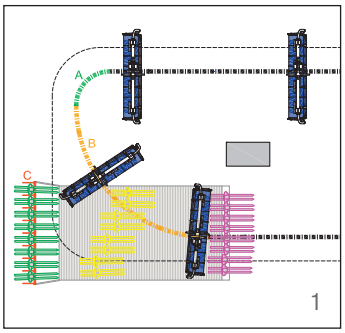
Description

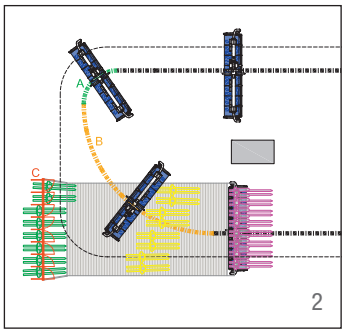
The station turnaround of the LEITNER HCL station is designed with two curves which have different radiuses. In the first curve, the chair makes a very sharp 90° turn. The second 90° curve, however, which follows immediately after the first, is designed with a very large radius.

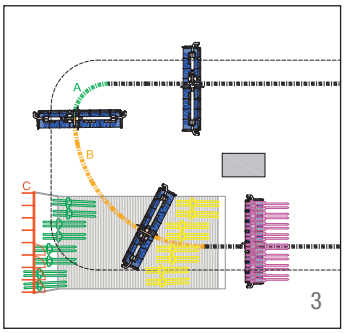
Guiding the chair through curves in this way means that when the chair reaches the passenger boarding area, it has already completed three quarters of the 180° rotation required for the station turnaround, and that there is essentially more space for boarding available than with the standard station.

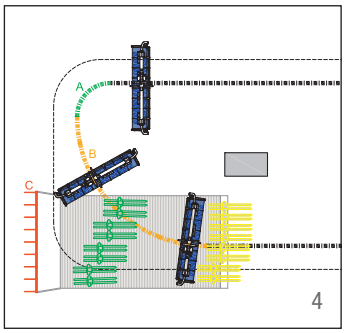
Additionally, the stream of passengers is controlled by an entrance gate, which opens at staggered intervals, so that the course of movement of the boarding passengers can be optimally adjusted to the geometry of the chair's curve track.

The LEITNER HCL station is also the perfect solution to optimally separate boarding and deboarding between gondola and chair when it comes to telemix systems.









Benefits

Thanks to the ideal **interlocking of the courses of movement** of the passenger and the chair, **more space** is created between the chairs, increasing the amount of time that the passengers have to “weave in” between the chairs.

Even at high transport capacity, **stress-free, comfortable** and **safe passenger boarding** can be achieved, leading to significantly **higher availabilities** for the operator.

If an installation is designed for maximum comfort, the HCL station, compared to the standard station, doubles the amount of time that the passenger has to board while the transport capacity remains constant.

Technical data

Station configuration	Drive station (drive frame movable by 2 m) Return station (max. lorry travel 5 m) Drive-tension station (max. lorry travel 3 m)
Possible transport capacity	Up to 3,600 p/h with 6-seater chairlift Up to 4,500 p/h with 8-seater chairlift
Station dimensions (station covering)	Length x width CD6-HCL: 22.6 x 8.6 m CD8-HCL: 27.1 x 9.8 m
Station turnaround velocity	Standard 1 m/s, can be adjusted to project specifications on customer request

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The **LEITNER Middle Station**

Variable deflection from 0 to 90°

Basis

Basically, the LEITNER middle station consists of two interconnected standard stations. The connection between the stations is adapted to the specific requirements of each project.

Description

Installations with several sections and separate rope loops are connected to each other by a connecting conveyor in the area of the station curve. Depending on the passenger capacity, the individual sections of the systems can be operated individually or run automatically in non-stop operation.

At systems with one rope loop, the carrying-hauling rope is led through the middle station and is deflected as required. The deceleration and acceleration devices of the individual sections are directly connected by means of a tyre conveyor. With this version, the middle station can be designed with a boarding/deboarding area or as a deflection station without boarding/deboarding.

At a single-sided middle station, for example, only the drive-up side (as a midway boarding for repeat runs at winter sports installations) is designed with a midway station. The system's rope guidance of the downhill side can be realised cost-efficiently without a midway station.

Benefits

The LEITNER middle station is **adapted to the specific requirements of each project**, allowing for a **random deflection angle** between 0 and 90 degrees.

Thanks to the use of standard station components, the LEITNER middle station can be **designed according to individual requirements** as a drive, return, drive-tension or deflection station.

Design examples

Middle station of a “multiple-section ropeway” with boarding/deboarding (GD10 Cable Aéreo Manizales)

Deflection station (CD4 Schaufelbergbahn)

Middle station as “top station” (TMX6/8 La Chaux Express)

Single-sided deboarding station (CD4 Kandahar Express)

Middle station with 90° deflection (GD8 Teleféric de Montjuïc)

Single-sided middle station with boarding and deboarding (CD6 Nationale Express)

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The **LEITNER Grip-Coupling System**

Certified safety for the station exit

Basis

In its fundamental requirements, the EU ropeway directive specifies that with detachable systems, it must by all means be prevented that a falsely coupled vehicle leaves the station exit.

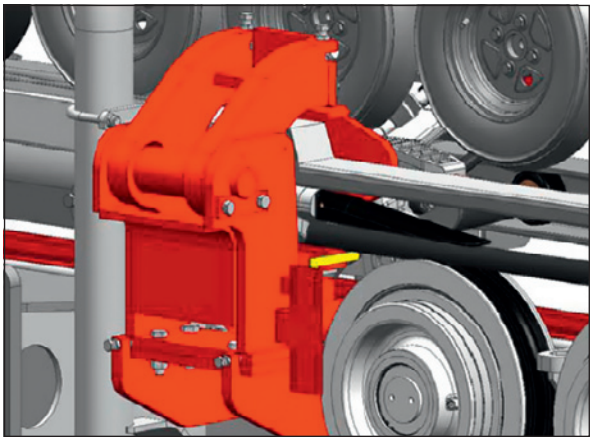
Description

When full travelling speed is almost reached right in front of the station exit, an abrupt, sudden stop of the vehicle prevents a crash but still has no less hazardous effects on the passengers or on the vehicle.

Therefore, the LEITNER grip-coupling system, which was already patented in 2005, prevents false couplings altogether. In the coupling area, the rope and grip guidance as well as the grip mechanism are constructively designed in a way that reliable coupling of the LEITNER grip can be guaranteed at all times, even in extreme cases such as:

- Breakage or damaging of rope guidance rollers in the station
- Derailment of the rope at the first tower from the station
- Ice or other obstacles on the guidance rail
- Breakage or wear of the grip operating elements as well as the grip running wheels

The complete coupling process is monitored in the highest electrical requirement class (AK4) and therefore achieves a maximum level of safety.



Benefits

The grip-coupling system, which is certified by (the German Technical Inspection Association) TÜV-Süd, allows the **omittance of the horizontal safety area** after the station exit, which is otherwise mandatory according to EN 12929-1. This allows for a **significantly better** and **lower rope guidance** within the critical area close to the top station.

In 2006, the LEITNER company received the **world's first permission** to build a system without safety area!

Therefore, stations equipped with the LEITNER grip-coupling system can be **installed even at exposed sites** where, up until recently, construction was deemed not possible because of the requirement of a horizontal safety area.

A lower guidance of the rope close to the station leads to **lower tower heights** and **less costs for ropeway** and **infrastructure** components. The low guidance of the rope just before the chairlift reaches the deboarding area definitively has a **positive psychological effect** (less anxiety) on the ropeway passenger.

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The **Quick Switch**

The LEITNER solution for flexible operating procedures

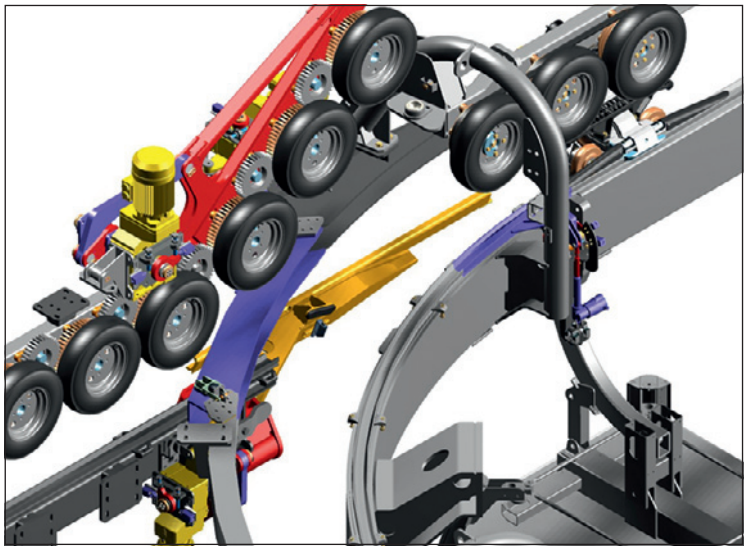
Basis

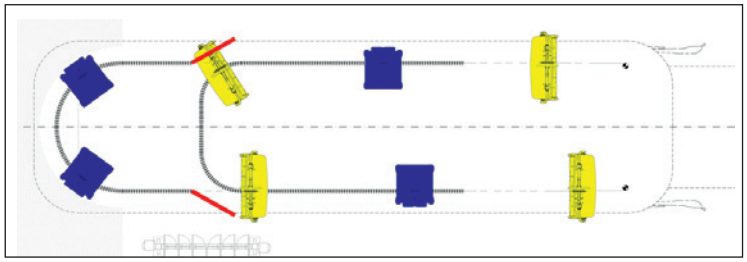
The Quick Switch was designed and constructed to enable a reduction of the switching time to 2 seconds max. This allows steering the vehicles onto different tracks during ongoing operation without having to turn the ropeway off or having to reduce the operating speed.

Description

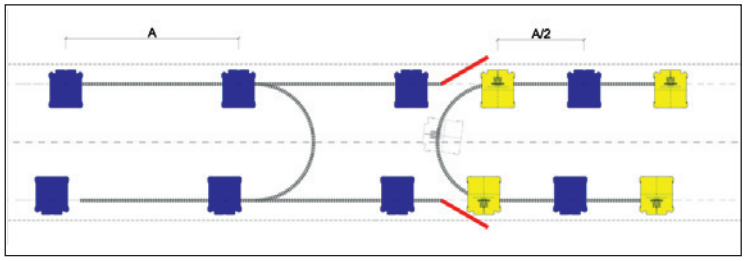
Employing a Quick Switch allows adjusting the transport capacity during ropeway operation. With it, the operator can always keep the installation in its optimal utilization by reacting flexibly to changes in transport capacity that may occur while the ropeway is in service (sudden onset of bad weather, transport capacity peaks of connecting installations). This not only minimizes wear and tear on components, but also reduces energy costs.

Further application options are double-loading areas for chairlifts with maximum transport capacities and/or separate loading areas for gondola and chair in Telemix ropeways. In multi-section installations, using the Quick Switch enables trouble-free realization of different transport capacities on individual sections or variations in the vehicle placement of the sections (chair/gondola partitioning in Telemix ropeways).

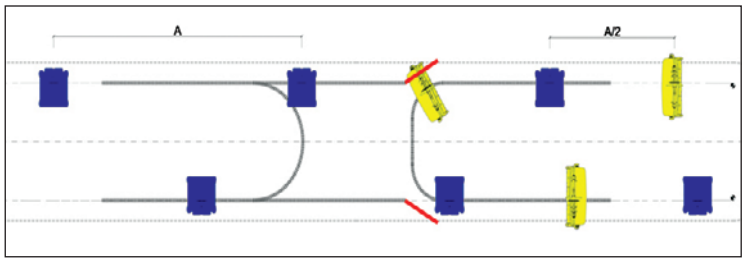




Double-loading area



Middle station with varying transport capacities



Middle station with varying placement of vehicles

Technical data

Switching time	2 s max.
Required pitch	at least 9 s
Switching cycles	at least 5,000,000

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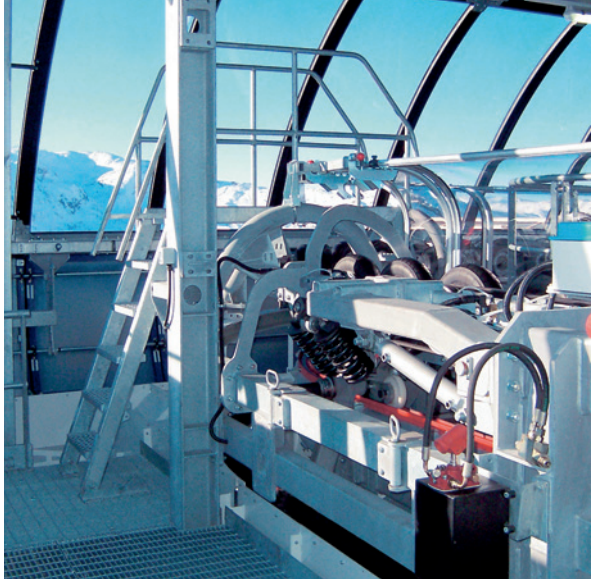


The **Integrated Maintenance Platform**

Patented grip maintenance on the station turnaround

Basis

The integrated maintenance platform allows for convenient execution of maintenance work on the grips on the station turnaround. An economical solution for installations without garaging possibilities in a closed building.

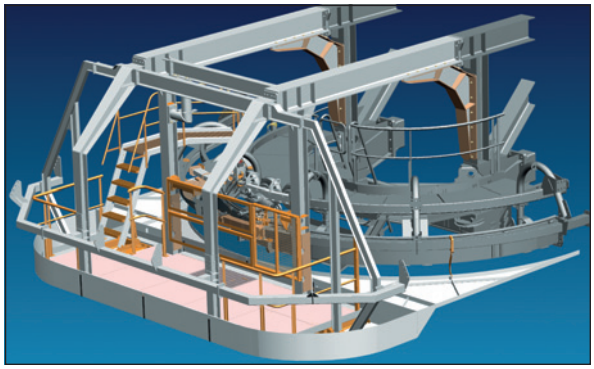
Description

The station curve of installations with an integrated maintenance platform is extended by an elongated station module which is accessible even behind the conveyor system. The length of the track within the station remains unchanged compared to the standard station.

The tyre conveyor in the straight part of the station curve can be rotated vertically. This makes the grip freely accessible for any necessary work.

A rotatable crane, a covering for all mechanical components and appropriate provisions for limited operation of the system during maintenance work meet all occupational health and safety requirements.

Since 2002, this proprietary system has been successfully applied around the world for automatically detachable ropeways.



Benefits

In the **weather-protected environment** of the station turnaround, **frequent inspections** and **maintenance work** at the grips can be executed **conveniently** and **safely** at any time of the year.

Maintenance work can be executed in a **time-saving manner** during the rotation operation of the system. An external garaging of the vehicles is not necessary.

Installations with an integrated maintenance platform and station garaging do **not require additional constructions** such as a parking building for the vehicles.

Technical data

Station configuration	Drive station (drive frame movable by 2 m) Return station (max. lorry travel 5 m) Drive-tension station (max. lorry travel 3 m), applicable for all detachable systems
Station dimensions (station covering)	Length x width CD4: 21.3 x 7.8 m CD6: 21.7 x 8.6 m CD8: 25.8 x 9.8 m GD8/10: 25.4 x 8.6 m
Station covering	High covering, colouring according to customer request

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The **LEITNER Box**

Modular station building – ecological, innovative, modern

Basis

The LEITNER box is a completely new concept developed for the realisation of modular-design station buildings. The variable set-up of the system allows solutions for any kind of customer or system-specific requirement.

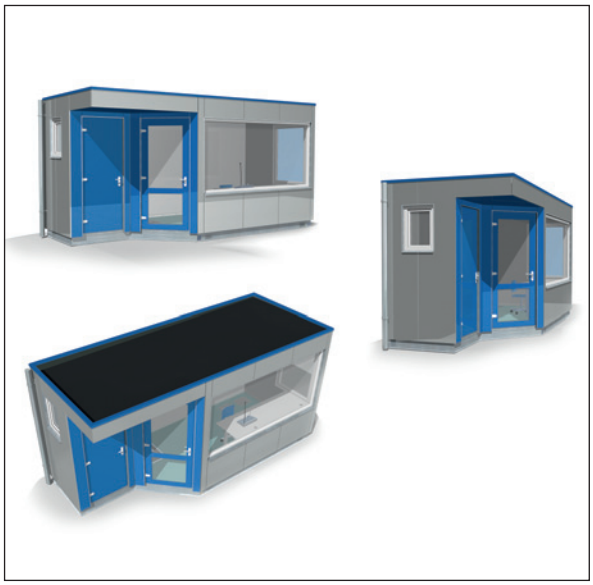
Description

The supporting structure of the building consists of a rear-ventilated steel tube frame, combined with a supporting construction of massive cross-glued wood.

In order to meet system specifications, the station building can be constructed from a variety of basic modules for the service room, the low-voltage room, the restroom (WC) and, if necessary, the compressor room. The facade, panelling, interior fittings and electrical installations (e.g. heating, lighting) can be chosen individually from a list of options which offers the basic versions Classic and Premium.

According to the system's individual transport and installation situation, the buildings are completely prefabricated and pre-wired at the factory in order to reduce installation work at the construction site to a minimum.

Official requirements in terms of fire protection, heat insulation and occupational health and safety (e.g. safety windows) have been updated to meet new standards. In addition, ropeway-specific requirements such as corner windows (barrier-free view of passenger behaviour), canopy and daylight conditions have been factored in perfectly.



Benefits

Very short installation times at the construction site thanks to **systematic pre-installation** of the electronic/electrotechnical equipment and furniture (cabinet, table) at the LEITNER factory.

A broad range of pre-dimensioned floor plans, design versions and feature variations allows for an **individual** architectural and system-specific construction of the station building. The majority of **building materials** used are **ecological** and **energy-efficient**.

The installation requires **no time-consuming or costly building constructions**. This means that **delays** which can occur due to unfinished building constructions **can also be avoided**.

No special transports needed. The modular construction system is also technically adjusted for **helicopter transport**.

Technical data

Average installation time at the construction site	1–2 days
Fire protection classes	Roof, wall and floor: F60/F90B Windows and doors: F30/F90B in ESF
Thermal transmittance values	Roof and walls: 1.0 W/(m²K) – 0.3 W/(m²K) Windows: 1.1 W/(m²K) Floor: 0.3 W/(m²K)
Static design criteria	Snow pressure: 6.0 kN/m² Wind pressure: 1.2 kN/m²

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