

Information and Communications Technology (ICT)





Top comfort and efficiency

Digitalization creates significant value added for ropeway systems. For Doppelmayr/Garaventa, Information and Communications Technology (ICT) means innovative product and service integration – entirely in line with the SMART Ropeway concept. The technical foundation was laid for increasing integration with the ropeway control system Doppelmayr Connect and the latest cabin generation. The next stage of development has been reached.

The result is top operational efficiency and safety on the one hand, and unprecedented passenger comfort on the other. Cabin functions such as lighting, ventilation, air-conditioning, seat heating and two-way communication can be controlled centrally using the straightforward ropeway control

system Doppelmayr Connect – and this can be done individually for each cabin. That brings a host of benefits for ropeway operators in ski resorts as well as in cities.

Benefits:

- Makes day-to-day work easier for ropeway operatives
- Greater operational efficiency through overview, transparency and system support
- Enhanced comfort and experience for passengers
- Plenty of individualization options thanks to a modular system
- For all applications – summer, winter and urban



➤ ICT – Products and services
make the connection

ICT Functions

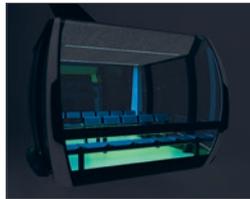
INFOTAINMENT FUNCTIONS



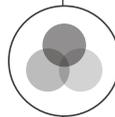
Public Wi-Fi



Cabin Display



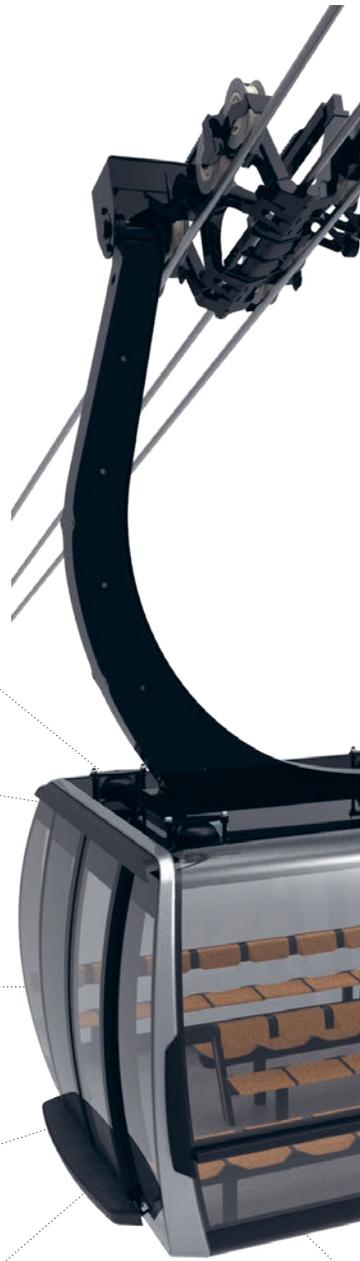
RGB Lighting



Cabin Sound System



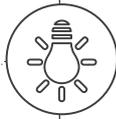
Digital Signage



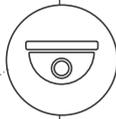
ROPEWAY-RELATED FUNCTIONS



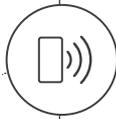
CCTV Monitoring of Line and Stations



Lighting



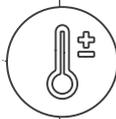
CCTV Monitoring of Cabin



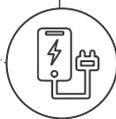
PA and Intercom System



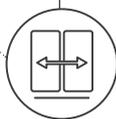
Seat and Window Heating



Ventilation & Air-Conditioning



Charging Station (Wireless and USB)



Electric Doors





ICT FUNCTIONS IN DETAIL



Lighting

A host of lighting options with LED elements inside and outside the cabins provide ropeway operators with a wide range of possibilities and enhance passenger wellbeing.

The ropeway control system Doppelmayr Connect can be used to switch the lighting on or off for individual cabins, all cabins or selected cabins as

a group. The entrance lighting, the indirect lighting under the seat bench and the indirect lighting in the ceiling can also be dimmed. In addition, a time switch can be programmed for all forms of lighting.

Entrance lighting

- Cabin illumination during night trips or as emergency lighting

Indirect lighting under seat bench

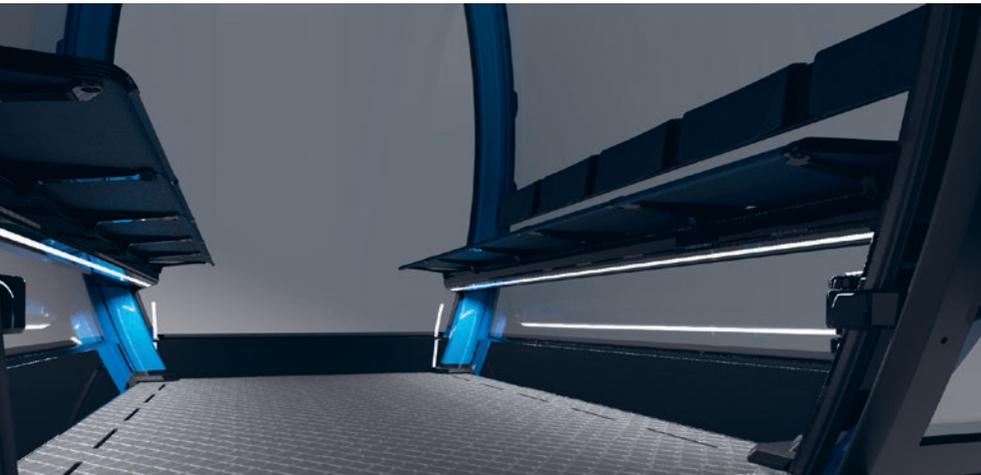
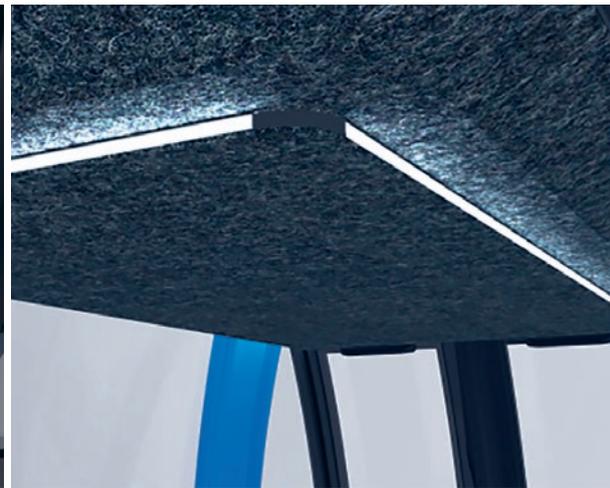
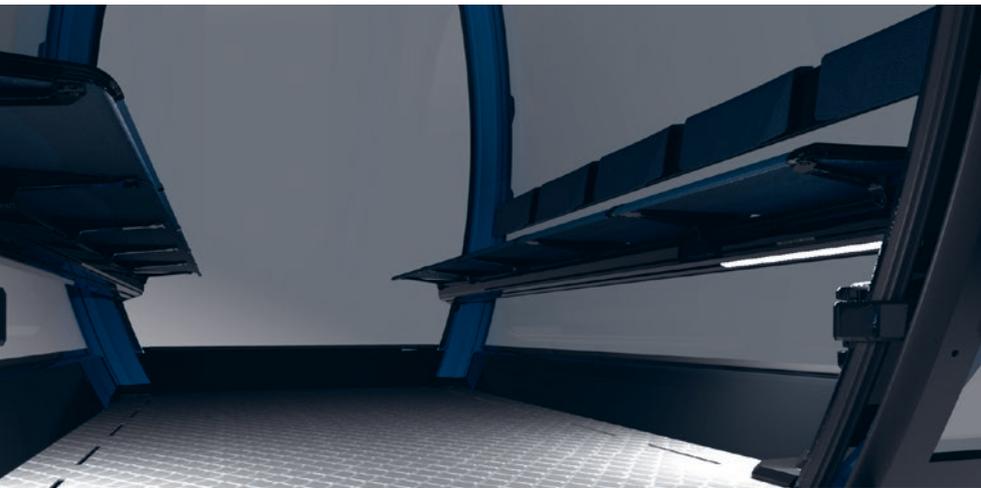
- Reflection-free view during night trips

Direct and indirect lighting in the ceiling

- Provides pleasant ambient light inside the cabin

External lighting in bumper

- Shows off the cabin in a very special light



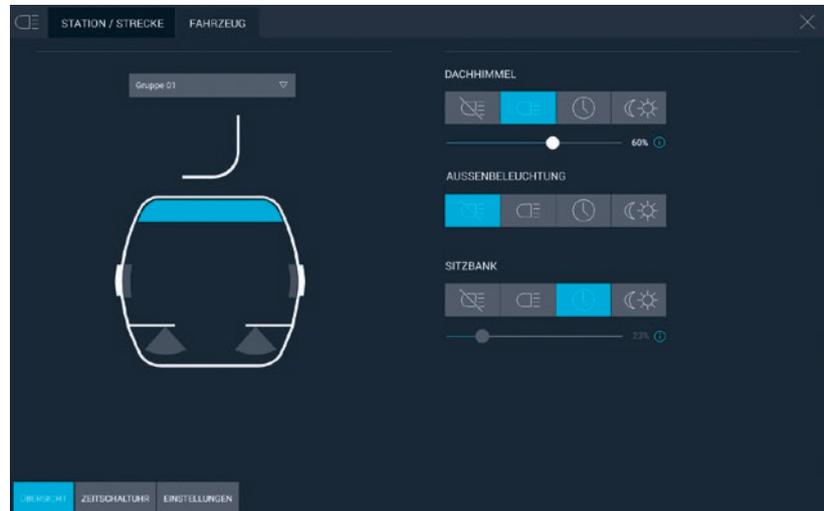
ATRIA

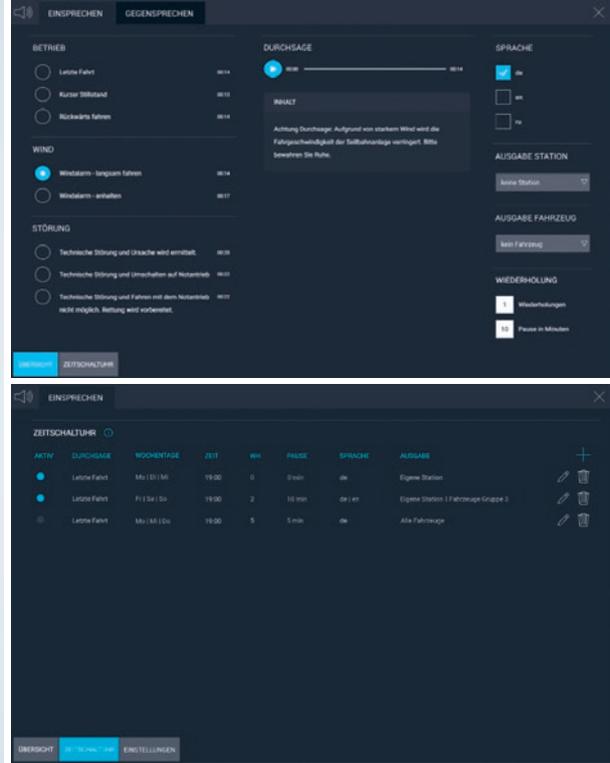
- Direct lighting in the ceiling
- Entrance lighting above the doors
- External lighting in bumper
- Indirect lighting under seat bench



OMEGA V

- Indirect lighting in the ceiling
- External lighting in bumper
- Indirect lighting under seat bench





PA and Intercom System

The PA and intercom system enables communication between ropeway personnel and passengers.

This function is possible using radio, Wi-Fi or LTE*.

Radio:

- The PA system installed in the ceiling enables operating personnel to address all cabins and to communicate any service announcements to passengers via a radio connection
- As an option, the automatic announcements from Doppelmayr Connect can be connected
- The intercom system provides direct communication between passengers and operating personnel

Wi-Fi or LTE* (cellular connection):

- PA system using station microphone or ropeway telephone system per cabin, per cabin group or for all cabins
- With the intercom system, the operator can accept or mute calls
- In combination with the CCTV monitoring function, a video image of the cabin interior can be shown when a call is made
- Integrated automatic function test of the intercom system
- Communication with individual, several or all cabins simultaneously
- Recorded multilingual announcements can be stored and played at the press of a button, on a time-controlled or position-dependent basis (Doppelmayr RFID system)

* LTE under development

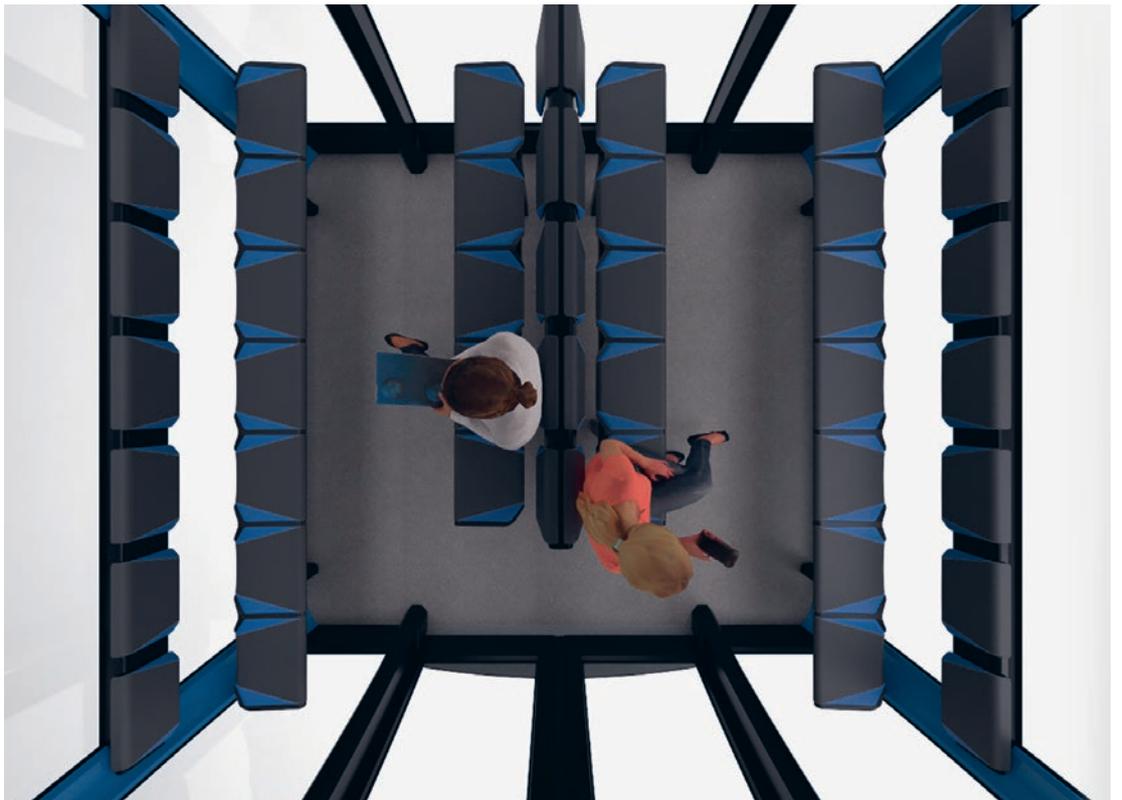
CCTV Monitoring of Line and Stations

Cameras can be used to monitor the ropes, the line, the stations and the towers. The CCTV monitoring can be controlled via a separate display unit in the control room.

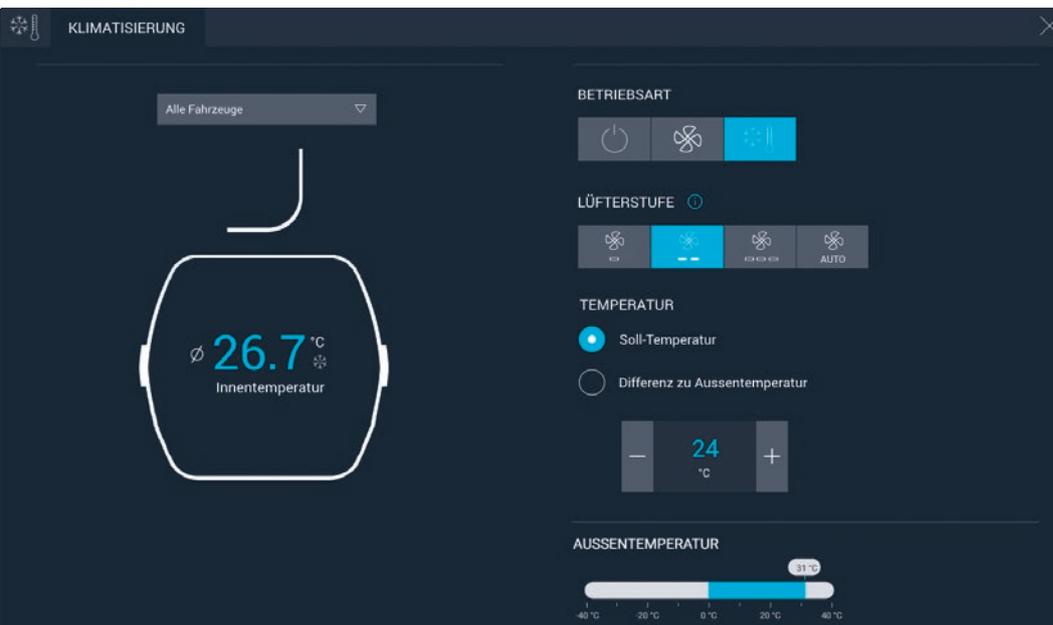
CCTV Monitoring of Cabin

Permanent CCTV monitoring of the cabin interior is possible with a camera installed in the ceiling. Each cabin is fitted with a separate camera that allows operating personnel to have visual contact with the cabin when necessary.

The CCTV image can be transmitted to the Doppelmayr Connect screen. In combination with the PA and intercom function, the image of the cabin interior can be displayed while communicating.



Ventilation and Air-Conditioning



A well-ventilated and air-conditioned cabin enhances ride comfort. Depending on where the cabin is to be used, a combination of various ventilation options is recommended to enable an optimal climate inside the cabin.

Active Ventilation

Active ventilation through the ceiling guarantees constant, uniform ventilation throughout the cabin. The fins are flush-fitted inside the air vents and blend in perfectly with the ceiling. In combination with hopper windows, the cabin can be actively supplied with fresh air.

Air-Conditioning

An air-conditioning system ensures a pleasant climate inside the cabin at all times. It is equipped with the functions cooling and heating plus an automatic mode. The air-conditioning unit is mounted on the roof.

The ropeway control system Doppelmayr Connect can be used to control active ventilation (with three speed levels) and air-conditioning (with three speed levels and automatic mode). The temperature inside the cabin is monitored by means of Doppelmayr Connect. The air-conditioning system is controlled either per cabin, per cabin group or for all cabins simultaneously.

Seat and Window Heating*



ATRIA

Permanent seat and window heating is operated during the trip. The required power is generated by carriage wheel generators. In addition, a heating profile can be defined.

Heating the windows during the trip prevents icing and fogging – to ensure a perfect view of the surroundings at all times.

With the Doppelmayr Connect ropeway control system, the seat and window heating can be configured for individual cabins, all cabins or for selected cabins as a group. In addition, the temperature inside the cabin and the outdoor temperature are shown on the display.

OMEGA V

The seat heating ensures a warm and cozy feeling inside the cabin. The seats are heated during transit through the station.

* Window heating is only available for the ATRIA 3S cabin.

Charging Station

USB Charging Point

Passengers can use the USB charging point to charge cell phones, action cams, portable speakers and any other electronic gadgets during the trip.

Inductive Charging Station

The inductive charging station offers passengers wireless charging for modern smartphones. The charging station is fitted to the optional handrail with concealed wiring.



Electric Doors*

Instead of mechanical door opening by means of a push-pull cable, the doors are opened and closed by an electric drive. The advantage of this function is that the door system can reverse if an object or person becomes trapped. The doors are properly closed, which also means fewer ropeway shutdowns.



* The electric door function is only available for the ATRIA 3S cabin.

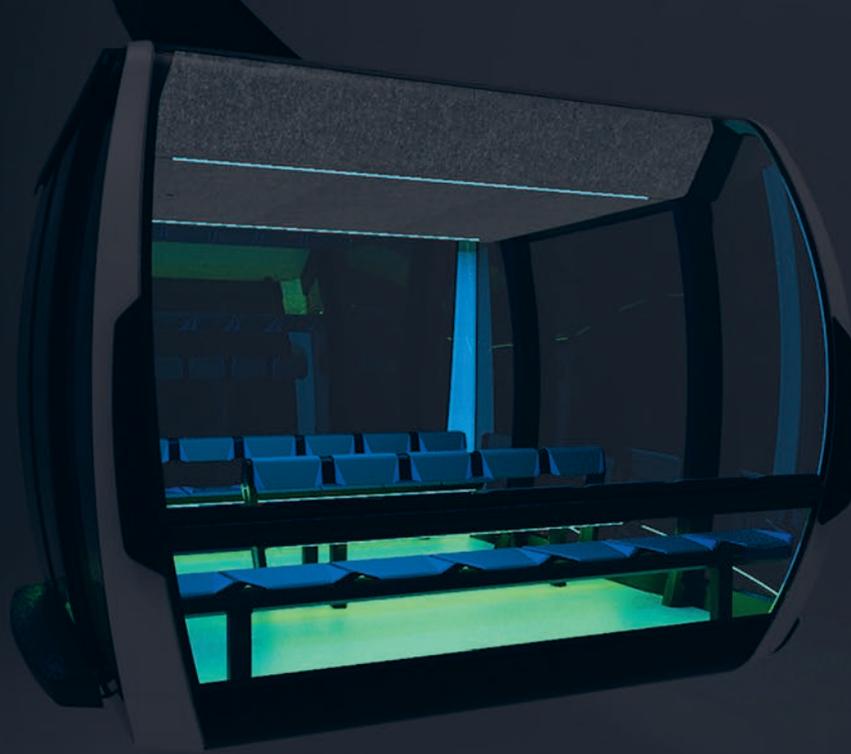


Public Wi-Fi

With public Wi-Fi, passengers enjoy the comfort of stable internet access. Visitors from abroad also avoid expensive roaming charges. The Wi-Fi homepage can be used to display useful, up-to-the-minute and precisely localized information on tourist attractions and events.

As a public Wi-Fi provider, the ropeway operating company benefits from:

- enhanced image
- transmission of the latest information (e.g. events)
- customer feedback opportunity
- knowledge of customers through statistics, targeted surveys or prize competitions
- cost-effective, regional advertising for own products
- placement of third-party advertising

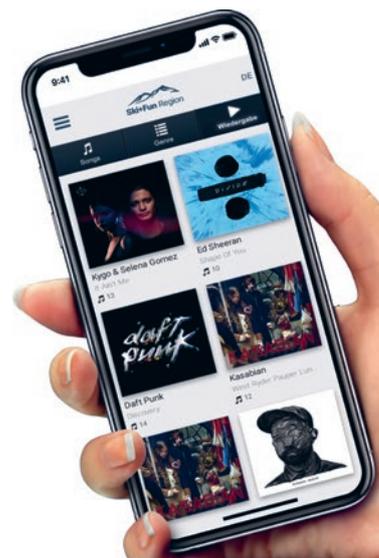


RGB Lighting

The RGB lighting function makes it possible to create different lighting moods in the cabin. These can be controlled automatically. RGB lighting on line structures is also possible.

Cabin Sound System

The Cabin Sound System offers passengers interactive audio entertainment with a stored music playlist. Passengers control the music themselves via the playlist on the operating company's Wi-Fi homepage. The company performs playlist administration through a web interface.



Cabin Display

This function enables ropeway operators to provide information for passengers via a monitor in the cabin. The monitor can also be used to show videos or ad-

vertisements. Content administration is performed by the operator through a web interface.

Digital Signage

Digital Signage combines Cabin Display with sound and content management as a complete passenger information system. Customer communication content such as news, information on events or advertising can be controlled through a web interface.

The Doppelmayr RFID system also makes it possible to activate advertisements or marketing messages depending on cabin position during the trip. Waiting times on the nearest ski lifts or, in the case of commuter transport, the next subway, railroad and bus connections, can be displayed in the cabin.





Power Supply

A power module supplies energy to the cabin when the ropeway is in operation. The daily power requirement, and therefore the required capacity, is calculated on the basis of the optional electrical consumers (functions) selected and the envisaged operating hours.

The large power module is used, for example, in the case of large consumers such as an air-conditioning system.

Power supply status information is displayed on the Doppelmayr Connect ropeway control system. WLAN enables the battery status and charging operations of individual cabins to be monitored in real time.

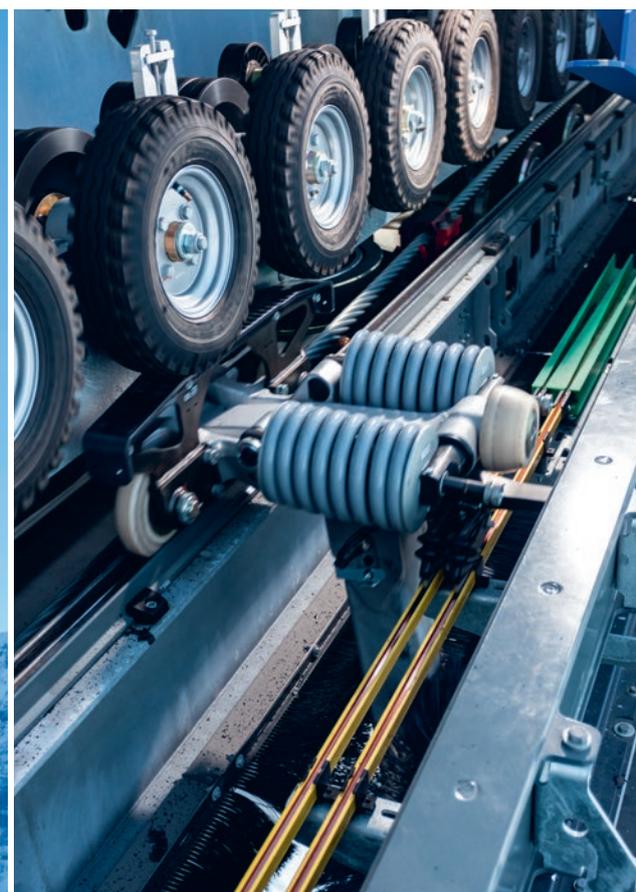
All relevant parameters for the cabin power supply are monitored. These include generator output, battery voltage, battery status and battery temperature.

Where does charging take place?

- In the parking facility
- During station transit
- During the trip

How is charging performed?

- Power rails
- Carriage wheel generator (CWG) on 3S systems (ATRIA)
- Charging socket on cabin
- Additional charge with solar energy (solar panels on the cabins)





FEDERKRAFT		KABINETÜR		FAHRZEUGGRUPPEN		ENERGIEVERSORGUNG		HARDWARE	RFID
FAHRZEUG	ZEIT	GENERATOR-LEISTUNG	BATTERIE-SPANNUNG	BATTERIE-STROM	LADENZUSTAND	BATTERIE-TEMPERATUR	LADUNG AKTIV	LAST-MANAGEMENT	STUMM-SCHALTUNG
1	15:05:29 03.07.2020	22 W	28.1 V	0.4 A	100 %	21 °C	●	●	●
2	11:10:14 03.07.2020	67 W	28.4 V	2.6 A	89 %	14 °C	●	●	●
3	15:05:24 03.07.2020	21 W	28.1 V	0.4 A	100 %	21 °C	●	●	●
4	15:05:32 03.07.2020	0 W	26.4 V	0.3 A	99 %	20 °C	●	●	●
5	15:05:39 03.07.2020	20 W	28.2 V	0.4 A	100 %	20 °C	●	●	●
6	15:05:39 03.07.2020	22 W	28.1 V	0.5 A	100 %	21 °C	●	●	●
7	15:05:30 03.07.2020	20 W	28.2 V	0.4 A	100 %	20 °C	●	●	●
8	15:05:30 03.07.2020	19 W	28.2 V	0.4 A	100 %	20 °C	●	●	●
9	15:05:34 03.07.2020	43 W	28.1 V	1.0 A	99 %	21 °C	●	●	●
10	15:05:37 03.07.2020	18 W	28.2 V	0.3 A	100 %	21 °C	●	●	●
11	15:05:26 03.07.2020	0 W	26.9 V	0.3 A	99 %	21 °C	●	●	●
12	15:05:39 03.07.2020	53 W	28.2 V	1.6 A	56 %	19 °C	●	●	●

Small Power Module

- 400Wh
- Lead battery
- Charging out of operating hours
- Additional charging with solar energy possible

Medium Power Module

- 800Wh
- Lead battery
- Charging out of operating hours
- Additional charging with solar energy possible

Large Power Module

- 9,600Wh
- Lithium-ion NMC battery
- Charging during and out of operating hours

Supercap

- 40Wh
- High-capacity capacitor with 166F
- Charging during operating hours
- 24h operation possible

CWG* Lean

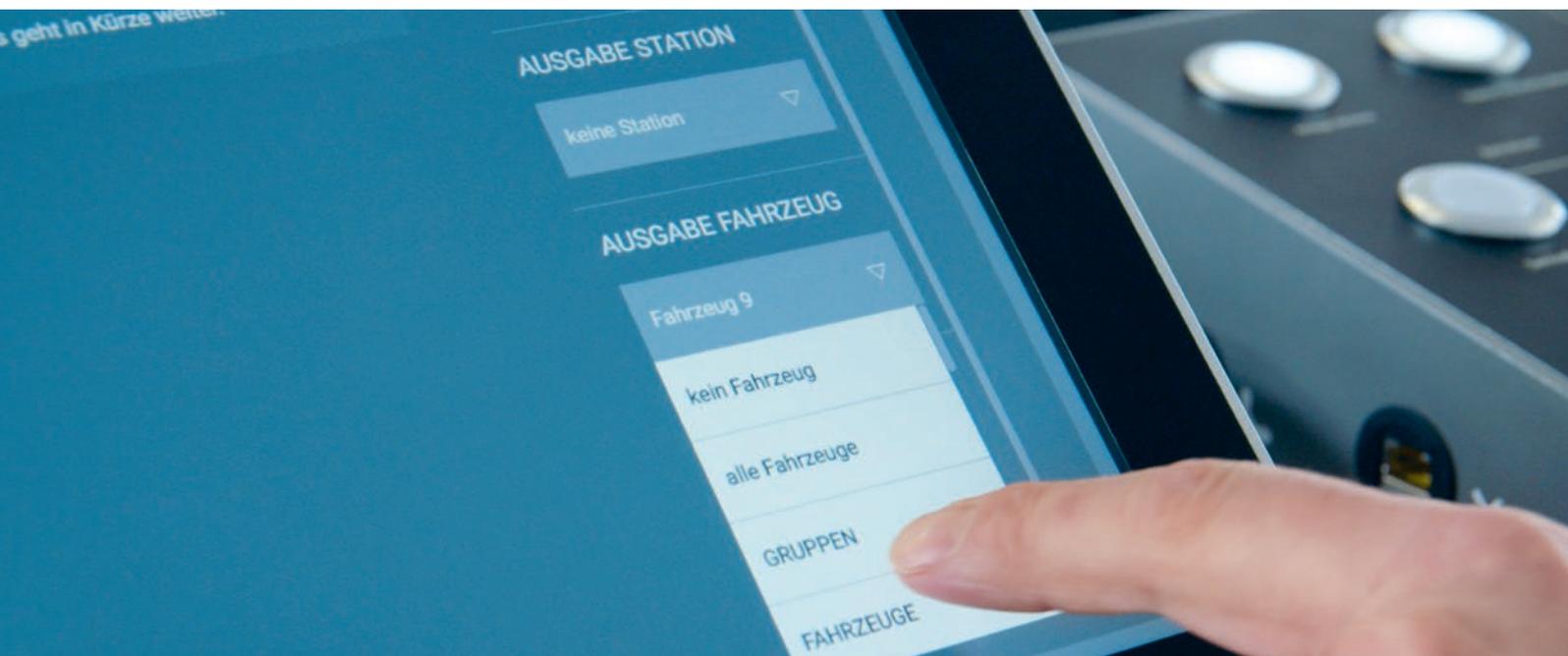
- 1 generator with 500W
- Power available during the trip
- No charging out of operating hours

CWG* Flex

- 1-8 generators with 500-4,000W
- Power available during the trip
- No charging out of operating hours

* CWG – Carriage wheel generator (only on 3S systems)

Control of Functions



Local Operation

- Electrical consumers can be switched on and off by means of a button on the cabin
- The local operation facility on the cabin is particularly well suited to ropeway installations with individual cabins for special occasions

Doppelmayr Connect (Connect Cabin Wi-Fi)

- Wi-Fi communication is used to fully integrate the functions into Doppelmayr Connect
- Enables the monitoring of battery status and charging operations, and shows the status of consumers
- Doppelmayr Connect can be used to switch individual functions on and off



Functions at a glance:

Ropeway-related functions

- Lighting
- PA and intercom system
- CCTV monitoring of line and stations
- CCTV monitoring of cabin
- Ventilation & air-conditioning
- Seat and window heating*
- Charging station (wireless and USB)
- Electric doors*

Infotainment functions

- Public Wi-Fi
- RGB lighting
- Cabin sound system
- Cabin display
- Digital signage

➤ Modular system –
Function retrofitting possible

* The functions window heating and electric doors are only available for the ATRIA 3S cabin.

730/dau/doma/moos/072020/200

the journey of connection



Service & Applications



Mobility & Experience



Advanced Connectivity



Relations & Reliability



Technology & Innovation