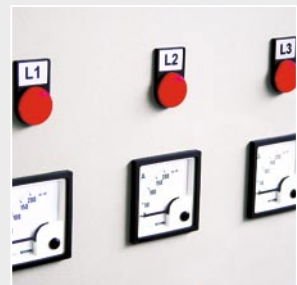


# MFD-Titan and easy800 Control Snow Cannons



The Czech company ALCEDO was able to use Moeller's easy800 control relay and MFD-Titan simply, quickly and cost-effectively to automate a complex water transport system at height differences of up to 200 metres, and thus provide snow on a 1200 metre long ski slope.



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## Simplicity as a concept

The outstanding feature of the easy series and MFD-Titan is their simple operation and program entry. The circuit diagram is entered by wiring each rung – in the same way as it was taught in schools and colleges: Contact – Contact – Contact – Coil, Done! The devices support 128 and 256 rungs for wiring. Series and parallel circuits, which generally make up the majority of a control system, are so easy to create without any knowledge of programming required. Ready-made function blocks which are simply connected to coils and contacts are provided for more complex tasks. Easy control relays replace many basic functions which in conventional systems the user previously implemented with individually mounted and wired components.

## Requirements of the control system

ALCEDO used easy800 and MFD-Titan to automate the snow system for a ski slope. Easy works until an ambient operating temperature of -25°C.

In order to make artificial snow on the ski slope, a relatively large volume of water has to be fed to a pressure system that is specially designed for the task. A height difference of 200 metres and the associated line length of 1200 metres make the control of this pressure system difficult to implement. Operation and control had to be designed as simply as possible for the operator, providing the maximum amount of status and fault information about the system. The programmable easy800 control relay in combination with the MFD-Titan were ideal for this application. With the simple handling of the well-established easy product series, easy800 and MFD-Titan combine virtually all the features of a PLC.

## Function

The water required for snow production is fed by means of large-volume pumps from the river to special tanks from which it is fed to the individual snow cannons. The pressure in the water line is kept at a constant 25 bar by the water pump with a power consumption of 90 kW. A Moeller frequency inverter is used to regulate the speed of the pump. The water pump conveys the water from the river to the tank and the water level in the river is evaluated by a comparator. If the water level goes below the specified value, this is detected by the easy control relay, which triggers the blocking of the system and the visual text indication of the fault on the MFD-Titan display. The water level in the tanks is also monitored by sensors via the 0-10 V analog input and evaluated using two analog comparators of the easy800. The secondary pump is switched on or off according to the values entered. The water level and the activation of the pump is also visualised on the MFD-Titan display.

The pressurisation process is started once the required water level has been reached in the tank, i.e. the condition of the second comparator has been fulfilled. The pressure value produced by the pump is monitored via pressure sensors using the 0-10 V analog input and passed on to the analog output of the easy800. By comparing the required and existing line pressure, easy800 decides on the further procedure. If the recorded water pressure in the line is low and the required water pressure high, the easy800 control relay sends an appropriate signal to the pump and the water pressure in the line is increased to the required value. A PID controller is used for the dynamic control of the pump speed. This ensures that water is provided for the snow cannon exactly according to the parameters entered.

The MFD-Titan display shows operating values such as pressure pump speed, the activation of the secondary pump, the water volume in the tank, the water level in the river and the current date and time. However, it can also display existing faults such as the overload of the primary pump, faults in the water pressure or water level sensor and therefore ensure that these faults are rectified swiftly.

## CONCLUSION

The operation and control of a complex water transport system could be implemented simply, flexibly and economically through the use of the easy800 control relay and MFD-Titan. Easy really is easy and offers together with MFD-Titan everything that you could wish from a state-of-the-art automation system: flexible networking, local and remote expansion, visualization, scalable performance, individual labelling and much more.

