



Avalanche trigger systems

The aim of the Avalanche Guard[®] system is to promptly identify and mitigate hazards while ensuring that nature is not adversely affected.

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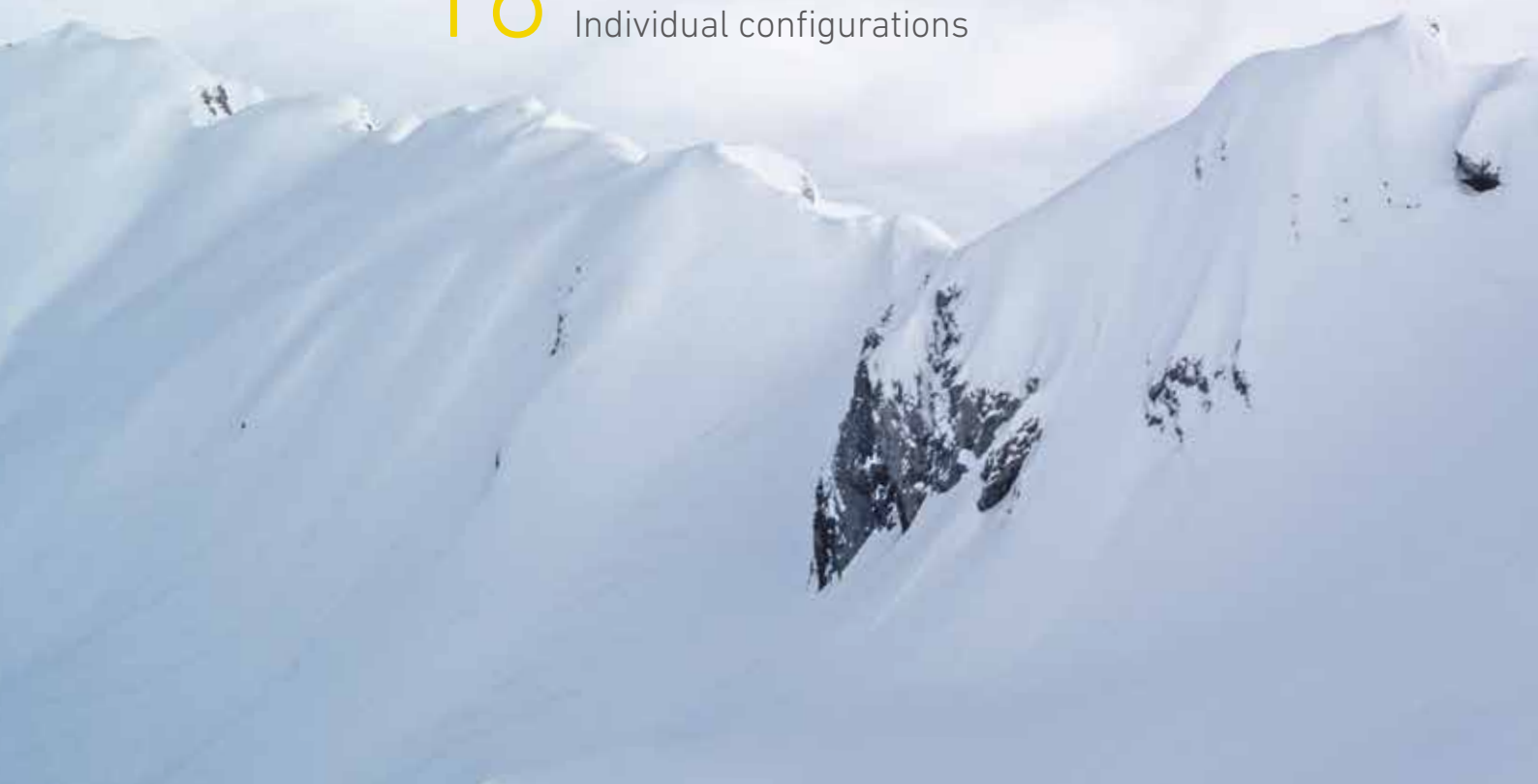
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Triggering avalanches with the system

Avalanches do not only endanger people's lives, but they also jeopardise the economic prosperity of tourist areas. They cut off access roads, interrupt operations in ski resorts and tear deep holes in the pockets of ski and tourism destinations. With the comprehensive Avalanche Guard® safety system from Inauen-Schätti AG, avalanche safety officers have a reliable and cost-effective solution available to quickly and efficiently control avalanches above residential areas, ski slopes, valleys and transport routes in any weather.

The avalanche trigger systems from Inauen-Schätti AG



AVALANCHE TRIGGER LM32

The new model of the Avalanche Trigger LM32 satisfies a clear customer requirement. Various customers operate ski slopes with avalanche paths which require frequent blasting to ensure slope safety, and road security systems also often require a large number of explosives to assure avalanche safety.

Avalanche Trigger LM32 is an Avalanche Master with a capacity of 32 explosive charges for remote-controlled, artificial triggering of avalanches. The drop module LM32 can be directly placed on the master by helicopter. A computer, tablet or smartphone is then used to deploy the explosive charge as required.



AVALANCHE MASTER LM 2700 / LM 5400

The Avalanche Master is an ideal supplement to an Avalanche Guard which shows off its optimum blast effect on steep slopes. The Avalanche Master is permanently installed in the avalanche start zone or at a hot spot and throws its load on

a rope, letting it detonate above the snow surface. The load cannot slide off and the full detonation force is ensured. The Avalanche Master is also monitored by the Avalanche Guard® system's control and equipped with the same thrown charges.



AVALANCHE GUARD LW 2700 / LW 5400

The Avalanche Guard is a permanently installed throwing system that is mounted in a well-accessible site; it can be reloaded and is equipped with at least 10 loads. The decomposable explosion cartridges are available in two different models – with 2.5kg or

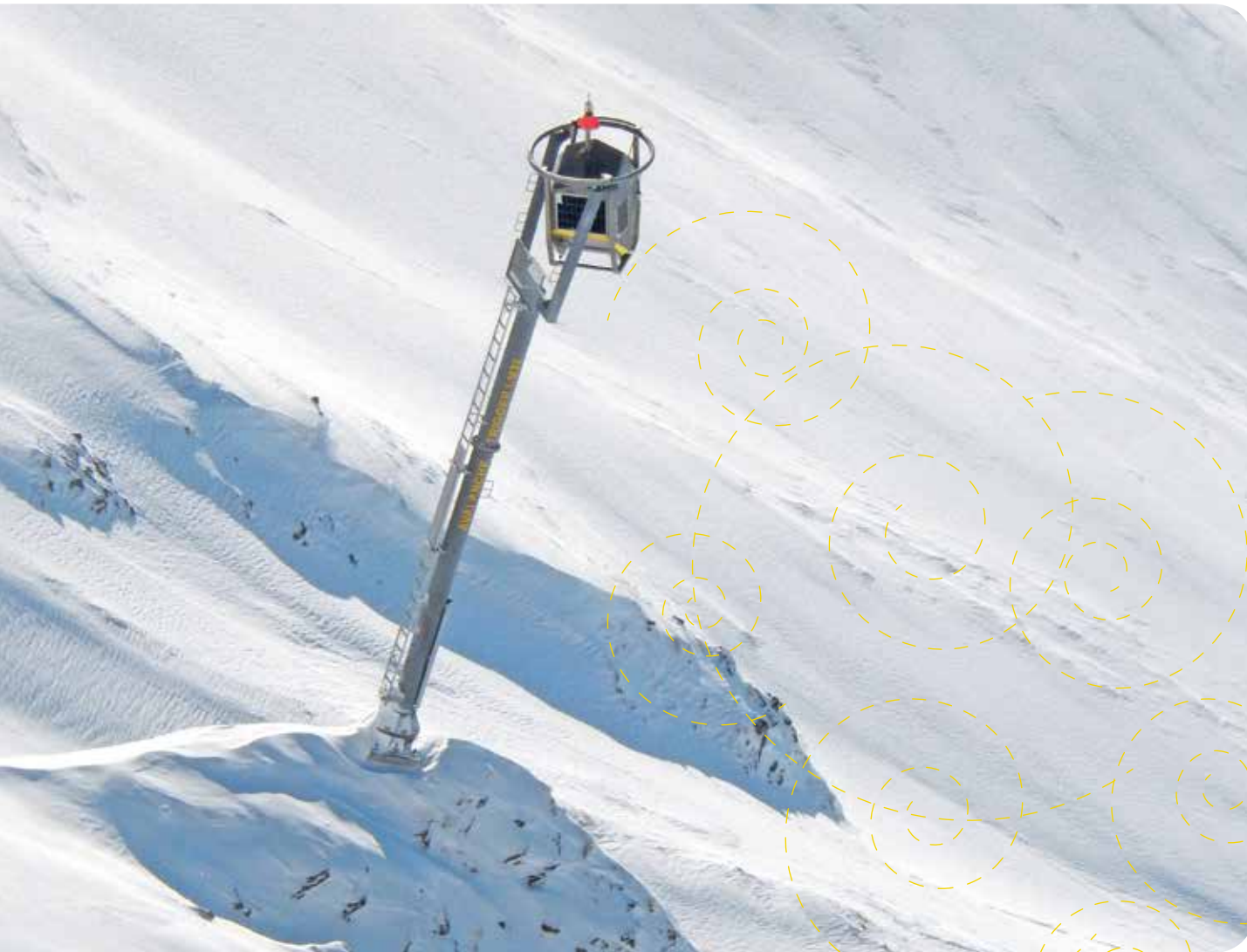
5kg explosives. The Avalanche Guard triggers avalanches via remote-control in areas that are difficult to access. The Avalanche Guard is the central unit within the Avalanche Guard® system for securing areas under the threat of avalanches.



BOOSTER 250 / MORTAR 5400

As a flexible throwing device, the avalanche pipe supports the effect of the two stationary systems within the Avalanche Guard® system where avalanches must be triggered quickly

and efficiently. The avalanche pipe is installed on a foundation or mobile on a snow cat. It can be rotated by a full 360 degrees azimuth and fires its explosives in three different inclinations.



AVALANCHE TRIGGER LM32

The new Avalanche Trigger LM32 model has a number of impressive features including the high number of explosive charges and the S-LOAD.

Securing roads, and high-use ski slopes both require a very high number of explosive charges and conventional systems need to be promptly reloaded. With the Avalanche Trigger LM32, we have not only developed a system with a high number of shots, but also one which can be simply positioned with the helicopter in the most remote locations. The Avalanche Trigger LM32 is available in 3 versions: 16, 24 or 32 shot versions. This creates an optimum configuration in accordance with client requirements and desired blast points. Each LM32 in the 16 shot variant can be converted to a 24 or 32 shot version at a later date.

The functional design prevents snow accumulation and the 6 solar cells supply sufficient power for the 2 accumulators which themselves provide the LM32 with power. This ensures high system availability, even in periods of bad weather when the computer-controlled trigger systems are very much in demand.

The modern design does not only take the weather into account, but also the blast after detonation of the explosive. In the lower area of the LM32 throw box, all areas are designed so that the blast can be optimally dissipated.

AVALANCHE TRIGGER LM32

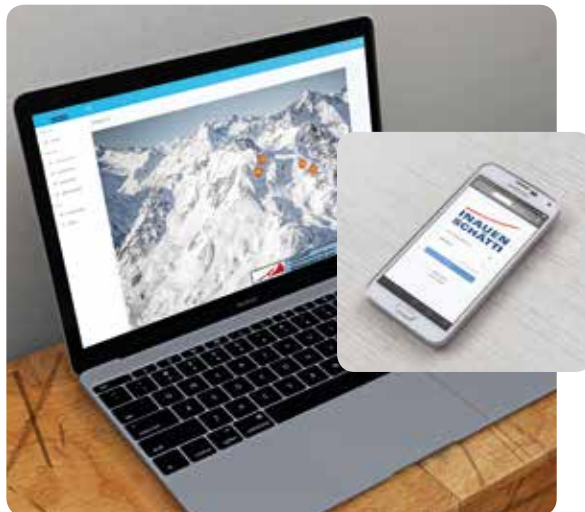


Preparation work becomes child's play

The only step that needs to be taken is to put a foundation in place with the special master ring. The deployment box can be comfortably loaded down in the valley. The S-LOAD loading system greatly simplifies this procedure. The LM32 deployment box can then be directly flown into the ring using the automatic «Auto Lock» helicopter coupling. This greatly simplifies the process since the helicopter pilot does not need to attend to any special equipment or focus on the location. The Avalanche Trigger LM32 has solar cells affixed to the whole perimeter which means that the layout in the ring is not significant.

ATMS – the new control centre

Once it has been placed within the ring, the position of the box is determined via GPS and other sensors and the 'ready for triggering' status is activated. The system is now on stand-by and can be activated if necessary. The 5 kg explosive charges can be deployed out via remote control from a computer, tablet or smartphone. The new web-based ATMS control allows for many new features with an extremely high level of safety. The communication can also be installed as a radio solution if required.



At a glance

- Up to 32 explosive charges in one deployment module
- Can be conveniently loaded in the valley
- Can be easily positioned in housing ring by a helicopter
- New ATMS control for convenience and safety
- Excess snow blast with up to 5 kg of explosives for the highest effectiveness and efficiency
- S-LOAD as a guarantee for maximum safety
- All-weather system



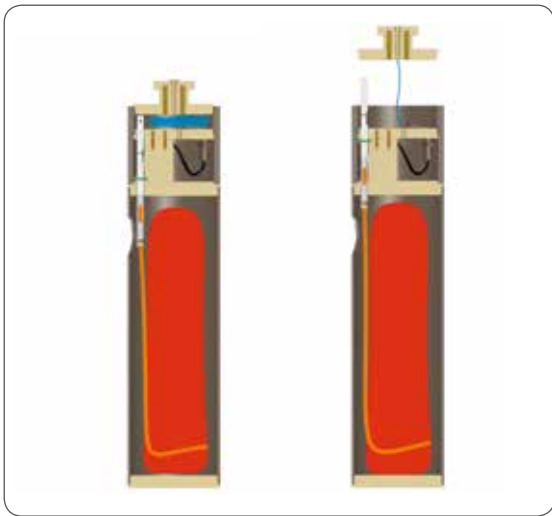
S-LOAD avalanche explosive charge

The S-LOAD avalanche explosive charge for the Avalanche Trigger LM32 ensures maximum safety.

The newly developed and patented S-LOAD explosive charge for the Avalanche Trigger LM32 explosive master features an impressive mechanism which combines the explosive and ignition material just before the blast. These are stored separately during transport and storage in the throw boxes. The S-LOAD explosive charge is divided into two parts. The upper part contains the bobbin and the ignition sequence (impact igniter, safety fuse

and explosive blasting cap number 8), whereby the explosive materials (explosive and detonating cord) are positioned in the lower part of the explosive charge. The explosive material and ignition material are separated by certified housing during transport and storage. This guarantees that no explosive material can be injected when positioning the ignition material. The possibility of mass ignition is checked for and excluded.

S-LOAD explosive load for LM32



How it works

When the explosive charge is deployed out of the magazine box, the holder cord must perform 3 tasks: it must tear off the impact pullwire igniter, connect the explosive and ignition material, and lastly retain the explosive charge over the snow cover! When the explosive charge hangs on the throw line, the lit safety fuse leads the fire to the explosive blasting cap. This then leads it to the explosive det cord, which is now located at the explosive capsule (due to throwing of the load in the meantime). The explosive cord then initiates the detonation of the explosive material.

Thorough inspection and testing

The key idea of the new S-LOAD loading system was to achieve a maximum level of safety, by keeping the ignition material separated from the explosive material until just before detonation. We tested and confirmed the functionality in numerous meticulous explosion attempts. Since the explosive sequence is only triggered by the unifying action when the load is deployed out of the Avalanche Trigger LM32, the explosive charge remains safe during transport by helicopter or when in its box. This means that, even when the ignition material is triggered, the explosive remains unaffected.



Explosives made from wood and cardboard

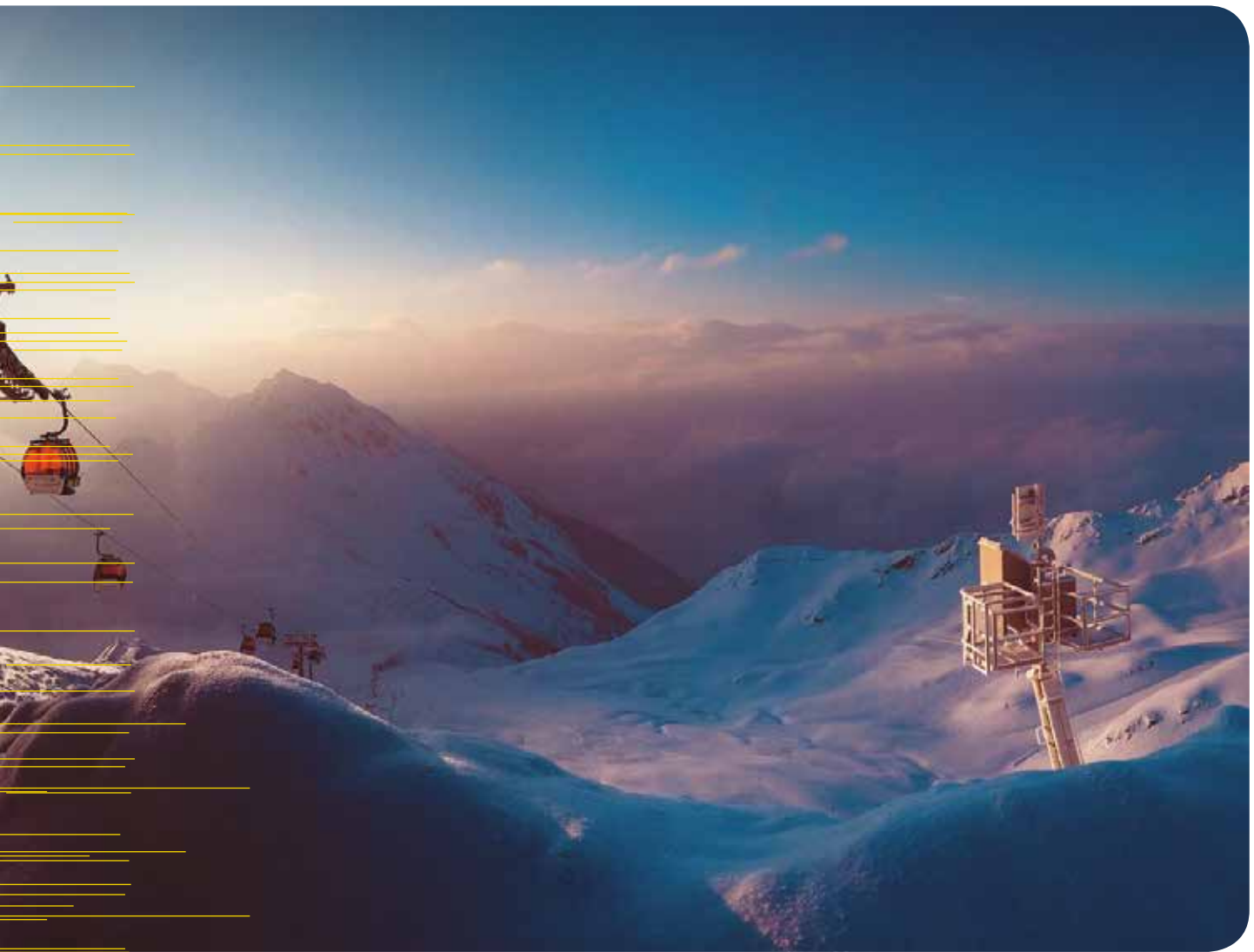
Materials for explosive charges, such as the ones used for Avalanche Guards and Avalanche Masters, are usually made from natural materials such as cardboard and wood. The material quickly decomposes in nature.

The spacious cardboard tube means that if the explosive cartridge is changed, an explosive amount of up to 5kg can be easily stored in the pipe without any problems. This results in an additional guarantee of availability for the future.



At a glance

- **SEPARATE:** The ignition material and explosive material are separated during transport and storage
- **SAFETY:** The design for positioning of the ignition material guarantees that no explosive material can be injected.
- Convenient handling ensured by the practical layout of the combustion material
- Simple and safe handling



AVALANCHE MASTER LM 2700 / LM 5400

Reliable and consistent: even on difficult terrains.

The Avalanche Master ensures maximum safety.

Controlled triggering of avalanches is particularly challenging on steep slopes. The Avalanche Master is the perfect addition to the Avalanche Guard and is the second pillar of the Avalanche Guard® system from

Inauen-Schätti AG. Explosive charges can be safely and reliably detonated over the snow surface to prevent the explosive charge from sliding away and to guarantee the optimum effect.

Avalanche trigger systems

AVALANCHE MASTER



Explosion on the rope

Above snow detonation | Avalanche Masters and Avalanche Guards are ideal additions for safe and controlled clearance of dangerous snow accumulations. The Avalanche Master is also equipped with 10 of the same decomposable explosive charges, in the 2.5 kg or 5 kg options, and operated from the same control program. However the explosive charge is not shot into the avalanche slope, but hung from a rope. It detonates above the snow surface so that it does not fall down steep terrain, and achieves its full effect in the start zone.

Safety at the push of a button

Safety on the slope | The Avalanche Master is fitted with a concrete base or anchored to the rock in the starting area, at a 25° incline. It offers space for 10 explosive charges and can be simply and safely maintained and supplied via the fold-up operating platform. Each explosive charge is equipped with a lowering coil which the blaster triggers via a computer command from the control centre. The power for the protective box, safety system and trigger is supplied via an integrated solar unit.



At a glance

- 1 protective box with 10 charges
- 2.5 kg or 5 kg explosive force
- 25° incline on the slope
- Control and management via PC, tablet or smartphone
- Safe, fold-out operating platform
- Solar-powered supply unit
- Decomposable explosive charges
- For clearing steep slopes
- Above snow detonation
- All-weather system



AVALANCHE GUARD LW 2700 / LW 5400

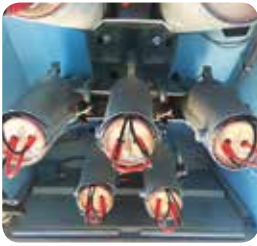
With an arsenal of innovative technologies, the Avalanche Guard permits safety at the push of a button.

The Avalanche Guard is the long shot module of the comprehensive Avalanche Guard® safety system from Inauen-Schätti AG. It patiently waits to be used. When it's time, the guard reliably executes its order at

the push of a button. Whatever the weather conditions and whether during the day or at night. It is characterised by its extremely reliable technology, its high safety standard and an effective range of up to 400 m.

Avalanche trigger systems

AVALANCHE GUARD®



Every shot is a hit!

Avalanche Guards are installed at easily accessible locations for reloading, on foundations or by using rock anchors. They are equipped with one or two protective boxes, each with 10 decomposable explosive charges, in 2.5 kg or 5 kg variants. These are manually loaded before winter via a stable, fold-up platform. The loads are triggered via remote control and shot at the individual blast points. They always reliably reach their target over distances of 200 m.

Safety at the push of a button

PC, tablet, etc. | The blasts are triggered from a safe location via PC, tablet or smartphone. The details of successful detonations (detected by the geophone) and available explosive charges, and other system data, is also displayed on the operating devices. A GSM transmission module or a radio unit transfers the commands from the operating station to the Avalanche Guard with maximum safety. The explosive charges are simply and safely thrown out at the push of a button. The power necessary for electrically controlling all of the functions is provided by the Avalanche Guard via a solar unit.



At a glance

- 1 or 2 throw boxes, each with 10 explosive charges
- 2.5 kg or 5 kg explosive force
- Hit targets across distances up to 200 m
- Effective range of up to 400 m (2 boxes)
- Control and management via PC, tablet or smartphone
- Safe, fold-out operating platform
- Solar powered supply unit
- Decomposable explosive charges
- For clearing hard-to-reach terrains
- All-weather system



BOOSTER 250 / MORTAR 5400

The Avalanche Pipe addresses the key safety issue – it makes avalanches explode rather than costs!

Safety should not be a matter of cost. This is why Inauen-Schätti AG offers the Avalanche Pipe, the flexible and extremely cost-effective individual throwing unit in the Avalanche Guard® system. The avalanche pipe can almost be seen as an extension of the patroller's arm

and acts as a mobile or stationary installation for safe and effective clearance of hazardous avalanche areas. The compact installation is ideal for a wide range of applications and permits a quick sequence of blasts from a safe location, even in bad weather.

Avalanche trigger systems

AVALANCHE PIPE / BOOSTER



Flexible clearance of avalanches

Ready for use | As an affordable explosive solution, the Avalanche Pipe makes it easy for blast experts to safely and effectively clear slopes and gullies. It reliably performs at the exact time and in the exact location for which bombardment of a hotspot is indicated. From permanently installed avalanche pipes to those mounted to snow cats, the inserted explosive points can be precisely shot in a 360° radius. This means that ranges of up to 250 m are possible.

Safe and environmentally friendly

Efficient use of the avalanche pipe is, as for all installations in the Avalanche Guard® system, not only weatherproof but also ecologically sustainable. This is because the explosive cartridges for avalanche pipes are actually the same products, made from a decomposable material, as those used for the Avalanche Guard and Avalanche Master. This means that users can guarantee safety in avalanche areas with a clean conscience.



At a glance

- Can be used in mobile or stationary applications
- 2.5 kg or 5 kg explosive charges
- 3 inclinations possible
- 360° throw radius
- All-weather use
- Decomposable explosive charges
- For flexible clearance of avalanches
- Range of up to 250 m



Individual solutions

Targeted combinations of the Avalanche Guard® system components create completely new possibilities

A combination of Fastload with an Avalanche Master permits excess snow blasts. At the same time, an explosive load from the throw module can be shot up to 150 m by the Fastload system.

This makes meeting different targets with just one throw box possible. A popular combination is to equip five of the ten pipes in the Avalanche Master with the Fastload system. The free pipe selection feature in the new ATMS control system means that shooting over large distances is possible from the upper pipes, and an excess snow blast can be created from the lower pipes, if necessary.

When purchasing a new Avalanche Guard, you have the choice of a Fastload option or the conventional design. Existing Avalanche Guards and Avalanche Pipes can also be upgraded with the new shot system.

The Fastload system can also be used with a Booster – in which case it greatly increases the loading convenience.

An integrated tear ignition unit in the throw load, combined with a special shot pipe, forms the heart of this new technology. The tear ignition unit, which is connected to the safety ignition cord, sharply tears after it has left the pipe.

Individual configurations – the way to increased safety and efficiency



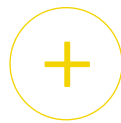
Combining the AVALANCHE MASTER with the AVALANCHE GUARD®

Enjoy the benefits of the combination of an Avalanche Guard with an Avalanche Master. You can save on on-site control and benefit from optimal flexibility in the number of explosion points. Positioning 20 explosive charges at one loading point also simplifies logistics.

This is only one example of how we respond to customer requirements. The wide range of avalanche trigger systems from Inauen-Schätti AG knows almost no limits within the area of artificial triggering of avalanches.

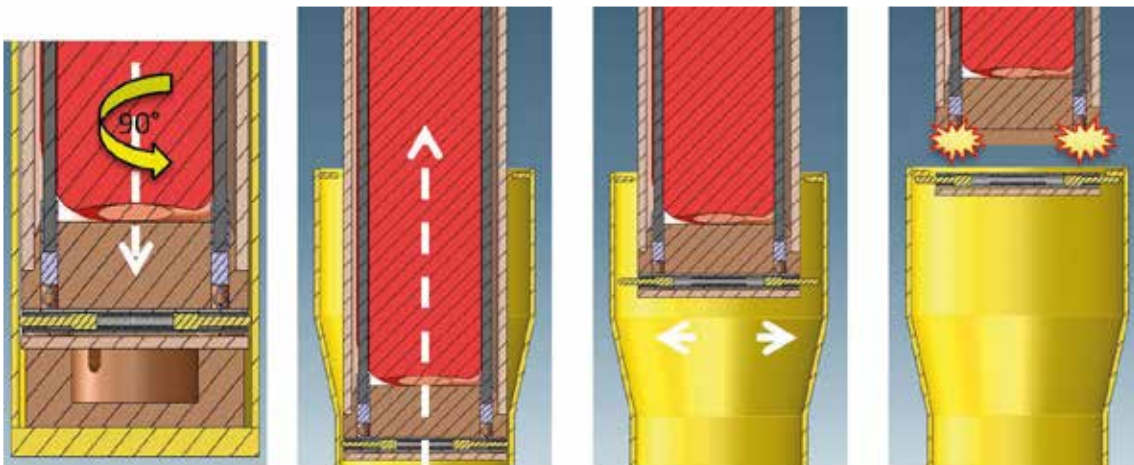
The FASTLOAD system

As part of the Fastload System, the throw load is only pushed into the pipe, and moved into position via a ¼ rotation. The explosion expert then needs to prime the load. This makes the loading procedure simpler and more efficient. As previously mentioned, this system is available for the Booster and Avalanche Guard and for the individual pipe selection feature within the Avalanche Master.



Potential benefits

- Simpler and quicker loading design
- Reloading is quick and convenient
- The safety level is further increased
- Existing Avalanche Guards® can be cost-efficiently converted to the FASTLOAD system





Safety and reliability are top priority

The controlled triggering of avalanches keeps ski and tourism areas safe. The safety technology of the Avalanche Guard® system from Inauen-Schätti AG means that people, animals, property and infrastructure can be protected from the consequences of avalanches, even in the highest mountainous areas which lie in the path of uncontrolled avalanches.

We have developed our cloud-based ATMS (Avalanche Trigger Management System) so that the system is available at all times, and can be operated with the highest level of safety.

ATMS – Avalanche Trigger Management System

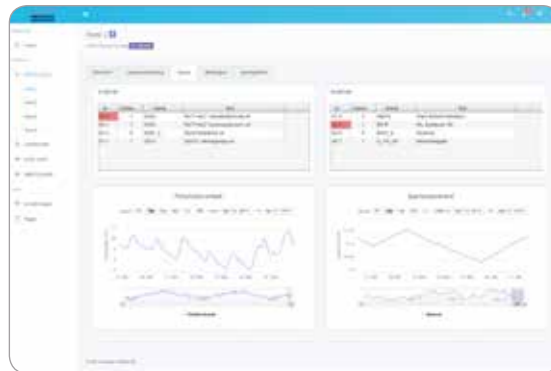


Safety is part of the program

All of the new systems from Inauen-Schätti AG can be ordered with the ATMS. For the cloud-based blast software, an individual server is set up for each customer. This adds another level of safety for the customer. Access is personalised and secured by a security code, just as for e-banking. The management and control program is simple to use and can be managed via PC, tablet or a smart device. But only those authorised have access.

Top level communication

The avalanche trigger system is always connected to you via the ATMS software. You can access the system at any time, wherever you are. Whether blast data or system data is concerned, everything is displayed in a clear way and can also be accessed via a remote maintenance feature in an emergency. The access authorisations are always defined in detail from the start, and the monitored area is represented in a clear way. Additional features are installed for the LM32, such as for example the GPS system which constantly checks the location and prevents incorrect positioning.



Depending on a customer's wishes, additional devices such as snow height measurement systems, avalanche radars, animal warning systems or weather stations can also be implemented.



Seminars and training courses

Artificial avalanche trigger systems demand the highest standards in terms of responsibility and know-how. Regular training is compulsory, both for our teams and our customers. Our engineers work closely with avalanche and explosive experts and are represented in specialist bodies and associations, so that we can continuously provide competent advice and support for you to realise your projects. We also offer training and service programs for products and for explosive charge manufacturing, because we take our responsibility seriously.



Always **personal**

A contact person is always personally available to our customers over the whole duration of the project.

Always **from a single source**

From planning through to assembly and maintenance of the installation, we guarantee seamless project processes.

Always **safe**

Our in-house service department is available for our customers 365 days of the year.

Always **possible**

We are happy to satisfy your individual wishes in terms of providing the required functionalities and meeting safety specifications.

Always **under control**

Thanks to the latest technology and regular system controls, any faults which occur can be quickly identified and remedied.

Always in stock

Modular standard solutions guarantee optimal availability of replacement parts for all of our installations.

Always in control

Our installations are in operation in Switzerland, Europe and North America, and are specially maintained by staff who have been trained by our experts.

Always up to date

Modernisations, further developments and renovations are performed by our experienced designers and engineers.

The best for our customers

Happy customers are the best form of publicity. We offer top-level service to meet customer wishes.

At Inauen-Schätti AG, we have many years of experience in avalanche safety. With **more than 400 Avalanche Guard® systems** in use in **Switzerland, Europe and North America**, we are a responsible and innovative partner for everything from planning through to assembly and soft-

ware management. Our avalanche safety experts are available to provide you with advice and practical help. They always do their best, and in particular when individually applying their full know-how to find the optimal solution for your requirements.

Do you have any queries, or would you like to organise an appointment? Our customer advisors are happy to help.



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About us

We are ambitious in everything we do so that we can offer our clients the best service from A to Z. At Inauen-Schätti AG, all of our work is focused on your wishes, expectations and satisfaction. Our specially trained employees have comprehensive specialist knowledge and many years of experience, and undergo continuous personal development. This is how we can guarantee top performance to you at all times.

The greatest challenges



Inauen-Schätti AG combines technology and engineering with safety and economic efficiency, as well as with a closeness to nature and permanent quality into a perfect association for successful projects.

Since it was founded in 1997, the Inauen's family company has continued to thrive and now offers a comprehensive spectrum of services in addition to a wide and multifaceted range of products. The internationally active company is based in Schwanden in the Glarus canton in Switzerland. This is the location of a first-class team made up of the management, administration, development and engineering departments, as well as an assembly and production plant, who are happy to help. We also have a subsidiary in Stans in the Nidwalden canton in Switzerland.

Our procedure is always solutions-oriented and we particularly value close customer relations in each project phase. This means that we can ensure that each order is executed in a way which is optimally matched to your needs.

This company with a team spirit and 70 employees in production, assembly, service, technical offices and development departments, offers strengths and top performance in its selected business fields. «No limits»? No, any challenges will be mastered with calculated safety because we promise our customers perfection and efficiency.

The business areas of Inauen-Schätti AG More than just ropeways

True to our «more than just ropeways» motto and in addition to the main business areas of aerial ropeways and inclined elevators, we also develop and produce special systems for challenging customer requirements.

The seven business areas also include a comprehensive assembly department for aerial tramways and special installations, such as stadium roofing, for example. Avalanche triggering systems and

hydraulic steelworks are also part of our company services. We hope that you will be inspired by learning more about the various business areas and our sample projects.



Avalanche Trigger Systems

Avalanche safety at all conditions on the mountain as well as in the valley



Aerial Ropeways

Compact Trams that inspire



Hydraulic steelworks

Robust and reliable



Inclined Elevators

Your experts at every hillside location



Cable Installation Systems

A cable installation system as a master piece of fastening and installing technology



Special Machines and Steel Constructions

When specialists are needed, then we are the right people



Special Installations

Where ropes and tension forces are a source of enthusiasm



More than just ropeways



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