

A MAGAZINE BY CONTRACTOR AND AUTUMN 2014 N° 2

High-Altitude Helicopter Rescues Northwire, LEMO's New Cable-Connection Students on the High-Tech Fast Track



2

55 de.

This summer the LEMO Group has grown by acquiring the American company Northwire Inc., manufacturer of custom and special cables. This transaction perfectly reflects our business philosophy to propose ever improving and complete solutions to our customers.

just like LEMO.

Together with Northwire, we will be able to propose connector & cable solutions meeting the highest possible requirements. It is not just another production unit, but rather the natural progression of our activities and know-how.

2014 is a symbolic year: LEMO started its international expansion exactly fifty years ago in Italy (see page 28).

I am very pleased to say that the driving force behind our development has always been the same: high quality connection solutions and the importance of human relationships.

**Alexandre Pesci** Corporate CEO LEMO

3

We only acquire companies whose culture is similar to ours.

Northwire is a family owned company targeting complex cutting-edge applications and totally dedicated to excellence, Photo: Jos Schmid

RICHARD LEHNER AND DANIEL AUFDENBLATTEN MOUNTAIN RESCUERS

## "Our modus operandi? Instant risk evaluation, a combination of experience and instinct, hopefully with a bit of good luck."

IN THIS MAGAZINE



4



- 6 TECH-BITS FROM AROUND THE WORLD
- 8 NEWS LEMO – Northwire: the timing was right
- 10 RESCUERS FROM ZERMATT Saving lives where nature rules
- 18 REDEL Vital connectors in the heart of hospitals
- 22 MOUSER ELECTRONICS A mine of new ideas
- 24 AMZ RACING TEAM Students on the high-tech fast track
- 26 TECHNOLOGY AND US Conflict-free minerals
- 28 HISTORY 1964 – LEMO goes international

### IMPRESSUM

EDITORIAL BOARD: Alexandre Pesci, Raymond Voillat, Serge Buechli, Judit Hollos Spoerli, Richard Thomas, Essencedesign

ENGLISH TRANSLATIONS: Judit Hollos Spoerli, Patricia Paredero

GRAPHIC DESIGN: Essencedesign

## TECH-BITS FROM AROUND THF WORID

### 1. FED UP WITH TRYING TO PARK YOUR CAR? AN APP WILL DO IT FOR YOU!

the car and let your car find a space and park minerals. All these valuable materials end up itself. Sounds practical, doesn't it? Unlike many in waste dumps. Recycling on an industrial other solutions, French Valeo's Valet Park4U scale is complicated, energy intensive and its is fully autonomous - no need to look for a environmental benefit is debatable. All this compatible car park. Its system is equipped could change: as part of e-waste processing with a laser scanner, four HD cameras and alternative research, VTT Technical Research twelve ultrasonic sensors. It is activated via Centre of Finland has developed a biologia smartphone application. The principle is cal filter made of mushroom mycelium mats. the same when it's time to drive off: just one They can recover as much as 80 percent of the click and the car manoeuvres itself out of the gold in electronic scrap, against 10 to 20 percar park and comes to pick up its driver at cent through the usual chemical processes. the entrance. According to Valeo, some cars VTT is also working on recovering other metals, could be equipped with this technology by such as copper, the metal most used in cell around 2020.

### 2. MARRIAGE SAVER (OR KILLER?)

Vestel has designed a television that makes it possible to watch two different programmes **4. WATSON HELPS MEDICINE** simultaneously both full-screen. The Dual View

### 3. GOLD PROSPECTING FUNGI

Cell phones contain gold, silver, copper and Arrive at the entrance of a car park, get out of other precious metals, including rare earth phones. This research was conducted as part of the EU project "Value from Waste" aimed at optimum waste recycling.

© IBM

Display uses 3D technology. It requires spe- Watson, the IBM cognitive computer, will be cial glasses: one pair can "see" a 3D image, working with Mayo Clinic to match patients the other can "see" another 3D image. One more quickly with the most appropriate clinsound comes from the television's speakers, ical trials. Patients' access to these trials (close the other one from the headphones. Two view- to 180,000 ongoing worldwide, including ers sitting on the same couch, in front of the 8,000 by Mayo Clinic) is currently done mansame screen can watch two different films. ually (patient records analysis, trial protocols), A new way of spending an evening together? which takes a very very long time. Thanks to its extraordinary capacity to analyse data, Watson could be speeding up the process to a great extent, as of 2015. This would be particularly important for cancer treatment, where time is vital. Watson could also contribute to refining personalized treatment and even promote new research projects.









7

## LENO-NORTHWIRE:

**LEMO** acquired Northwire this summer. Together, the two companies will be able to provide their mutual customers with high-quality complete cableconnector solutions.

LEMO had been looking for a cable manufac- the transition from the founder's son to his Initially, there will be a period for adjustturer for quite a time already. "We realized daughter a few years ago. She needed to find ment between the two companies in order that some of our customers were no longer synergies that would, for instance, develop her to coordinate key indicators, information assembling connectors to cables and so distribution network." points out Raymond systems, standards and to get to know they were working with subcontractors. Why Voillat. Northwire, acquired on 27<sup>th</sup> June 2014, each other. LEMO will gradually consolidate not offer them a complete solution then?" will now be able to rely on the 18 LEMO sub- its acquisition. explains Raymond Voillat, LEMO's sales and sidiaries well-established internationally, some marketing director.

However, it wasn't easy to find the right opportunity. LEMO needed a cable manufacturer LEMO is the "perfect buyer" in the eves of the other near to Mexico. The LEMO USA that was not too large, with a family compa- Northwire's CEO, Katina Kravik. The US complant is in California and LEMO is represented ny culture that could fit in with LEMO. More- pany had not particularly been interested in throughout the United States by a network of over, the selected company had to generate an acquisition, but "it makes sense" to join a distributors and reps. The production of hara maximum of synergies, without creating high-tech company solidly present worldwide. nesses (cable-connector assemblies) will take market conflict.

The inventor of the Push-Pull connector first the United States, near Minneapolis: the fami- change either. "We are taking over the compa-Northwire was the right size for an acquisition. on the long term" adds Raymond Voillat. Moreover, Northwire is active in complex and cutting-edge fields of application and in niche "As Aristotle said, 'The whole is greater than markets, just like LEMO. Their customers are the sum of its parts.' LEMO + Northwire equals overwhelmingly American, in the medical, in- increased capacity and market share for both" dustrial and defence sectors. "This company says Alexandre Pesci, LEMO's CEO.

is at a key moment of its existence, following

started research in Europe, but did not find the Northwire's acquisition does not mean that the existing facilities have enough extra space and right match. Finally, a company was found in brand disappears and management will not production capacity. ly-owned Northwire has perfectly met LEMO's ny as it is. There is no duplication between the LEMO's third generation, Alexandre Pesci, requirements. With a staff of 200, against two parties and therefore no job cuts. On the has no excessive acquisition policy. The latest the 1400 employed by the Swiss company, contrary, we are hoping to increase our staff one was the acquisition of a long established Canadian distributor in 2012, in a country where LEMO had no subsidiary yet.



anniversary (Japan).

rapidly enter new markets" adds the CEO.

of them celebrating their 50<sup>th</sup> (Italy) or 20<sup>th</sup> The first synergies will be applied on the American market where Northwire owns two plants, one near the Canadian border and This operation "opens up new opportunities to place on a case by case basis, depending on customer proximity. No new factory construction has been planned in the near future, the

# SAVING LIVES



Switzerland's iconic Matterhorn is a dangerous beauty. **Richard Lehner and** Daniel Aufdenblatten, two local rescuers, fly Air Zermatt's helicopters to save climbers in danger. Their world record helicopter rescue in the Annapurna mountain range was recognized by their being awarded by the international civil aviation world's "Oscar".

▲ Lehner (left) and Aufdenblatten: two brains, one mission.

The Matterhorn. A majestic alpine peak of breathtaking beauty. It is so beautiful that it is acknowledged to be the world's most photographed mountain. At its foot, Zermatt, a Just like probably all the young men from the charming car-free village, with a population of narrow Mattertal valley, Richi and Dani (as they 5800, has become a famous ski resort, welcom- call each other) have both tried to distance theming 3 million visitors per year.

a hundred people reach its summit at 4478m. the pilots for famous Air Zermatt. "Zermatt, some of the climbers say with regret, is the Disneyland of mountaineering."

Still, beneath its beauty and accessibility, the benefit from is extensive: 45 years of helicopter Matterhorn remains a high Alpine summit. Danger is ever present and the weather is extreme erations per year, 130 (one every three days) of and unstable. One short storm, a wrong step or which require the expertise of a rescue specialist. missed grip and the dream turns into a nightmare. Its first successful ascent in 1865 had been Unsurprisingly, local people have developed climbers lost their lives.

The Matterhorn hurts, kills and sometimes swallargely visited.

Almost every year the mountain lets someone go. The remains - bones, clothes, equipment - Spectacular but also efficient and cost effecare often found in a well preserved state. Some tive, long-line technique has revolutionized high date back to the previous year, some others to mountain rescue. Continuously improved, it is taught by Swiss pilots and rescuers. In Nepal for several decades

Richard Lehner, 44 and Daniel Aufdenblatten, 39 know these stories very well. Both natives of Zermatt, they grew up with them. Sitting in the cosy lounge of the Monte Rosa, a prestigious hotel built in the middle of the 19th century, the two men correspond with our image of mountaineers: calm, reserved, definitely low-key, but starry-eyed.

As a child, Richard Lehner, son and grandson of mountain guides, would listen to tragic stories and heroic rescues at the dinner table. Daniel Aufdenblatten was more fascinated by the helicopters flying over Zermatt.

"When Richi and I were young, he says, helicopter rescue was in its early days. Before that, rescuers had to go on foot to reach stranded climbers and many died. Then suddenly, it was possible to retrieve them quickly, even in remote, hard to reach places. It was revolutionary." Lehner agrees: "These rescuers were our heroes".

selves from these mountains - Lehner trained as a plumber and Aufdenblatten as a medical stu-The icon of the Swiss Alps is a MUST for climb- dent. However, their childhood dreams caught ers. Its slopes - apart from its difficult north up with them. Lehner became one of the rescue face - are sometimes almost overcrowded. specialists of Rettungstation, Zermatt, the local On a beautiful summer's day, it happens that rescue company. Aufdenblatten became one of

> There is no better place for rescue training than the Matterhorn. The experience that rescuers rescue. It is also rather intense: currently 1600 op-

a widely publicized warning: four of the seven methods and equipment that are used all over the world. Tripods used for pulling out people from crevasses, special harnesses for evacuating the wounded. They also developed the longlows. Since the fifties, between 30 and 40 peo- line, a technique that Air Zermatt was the first to ple have simply vanished from its slopes. A total use for a mountain rescue (it was in 1970, on the of about a hundred climbers went missing in its north face of the Eiger). This method is used to immediate vicinity, however well-known and get the rescuer near to the emergency site by suspending him on a 30 to 200m rope beneath the helicopter.

Air Zermatt's heliport is located on the lower doesn't work, we try plan B. Then C..." edge of the village, on a metal platform. This is where the company's nine bright red helicopters Unstable winds and the proximity of rocks an avalanche and yes, they are comfortable are based (Bell 429, Lama A315, Ecureuil B3 and require the pilot's extreme concentration and hanging on a cord under a helicopter with Eurocopter 135). It is here that one of the pilots is subtle manoeuvring. Low air density further 2000m of void under their feet. "When I see always on 24-hour duty for emergency take-off. complicates the situation: the higher the alti- them hanging there, I'm very happy to be the

Rettungstation Zermatt rescue specialists - page 17). In the Himalayas, pilots often reach the there are a dozen of them - take turns to ensure limits - one fraction of a second too long and On a mission, the pilot and the rescuer are in round-the-clock service.

explains Aufdenblatten, you just need three pilot", Lehner reassures us. things: a good pilot, a good rescuer and good weather" Zermatt has the first two, there is just Once landed, the rescuers are in their world: the weather...

Mother Nature is the absolute ruler. In just a few the continents. He has climbed the Matterhorn The pilot confirms: "In the case of a commerminutes the situation may completely change 230 times, three times by the north face. and local conditions may vary. "So we always go to see on site: it is only up there that one can "I trust him completely, confirms Aufdenblatten. happens instantly." really get a clear picture of the situation."



### Daniel Aufdenblatten

At home: born in Zermatt, 39, married with

At work: helicopter pilot for Air Zermatt, corporate pilot (helicopter and plane).

6000 flight hours, 1300 mountain rescue operations in the Alps and

tude, the less powerful the helicopter is (see *pilot!*" Aufdenblatten laughs.

the engine stops. A slight deviation can smash constant radio contact through their helmets. the rescuer or the blades into the rock face. Two brains, one mission. This is how the partner-"For a successful high altitude rescue operation, "Daniel is an excellent and extremely precise ship between Lehner and Aufdenblatten works

the cold, the rocks, snow, ice and verticality - this All the same, despite all their experience, noth-

If he tells me I can go, I know I can. If he savs no. I know he's right. I will never push him nor try to make him change his mind."

was started in 2010 with Fishtail Air, one of the the pilot bring the rescuer? Can he land or must colleagues have been trained over three years he use a long-line? Is there enough room for the in all possible mountain rescue situations. They doctor? "We choose a plan A and give it a try. If it know how to use harnesses, stretchers, winches. They can evacuate six people on the same long-line, extract someone from a crevasse or

> to perfection - they have been working together for 10 vears.

is their passion. As an experienced mountain ing should be taken for granted. "Every rescue On the Matterhorn, just like in the Himalayas, guide, Lehner has led many expeditions on all is different, one has to be ready for anything." cial flight, you know all the parameters before take-off. Here in the high mountains, everything

among the rocks, for example when he found climbers in danger. himself in the middle of a storm. "I could feel the thunder made me deaf for three days."

a wounded climber, surrounded by rocks and to feel responsible. This is destiny. They are in a get away as quickly as possible."

Risks are part of the job, but the two men re- and that's exactly what we do." fuse to gain any personal glory. "The expression marketing, only good for selling books!" insists Their faces darken when some of the bad meminstantly, but their instincts - a word chosen even though it's their job, they are deeply moved. by Aufdenblatten - are built on many years of experience, thousands of rescues in the Alps and They prefer to talk about the many happy ends:

the Himalayas. Safety rule number one is: know- together with their colleagues, they have saved ing when to stop. Never ever go too far.

heat of the lightning through my clothes and the The decision is never easy to make. "Obvious- This is what motivates them. The satisfaction ly, we live to save people and not to go home of being able to help, to save people who - like *leaving them on the mountain. However, when* them – love the mountains. The rescuers do not On another occasion, as he was approaching it does happen, we need to accept it and try not expect anything special in return. ice that could slide away any time, the rescuer poor state, in the storm, under the snow, it's mi- Luckily so, because rescued people are not recalls that all he wanted was "To finish it all and nus 30 degrees and night is falling. It's a terrible often grateful. Lehner laughs out loud: "I think situation, but coming here was their choice. Our only about 1% of them say thank you!" Many of *responsibility is to try our utmost to help them* - them think that assistance is only natural, adds Aufdenblatten. "Many others feel embarrassed that they had to be rescued. This is something "They risk their lives to save people", is pure They have seen dramatic situations, of course. that we need to take into consideration."

Aufdenblatten. Lehner confirms: "We do not see ories resurface (serious injuries, death, cases It was destiny that the two Swiss rescuers got things this way. We constantly evaluate the risks of human ignorance...), they will not talk about more recognition than their colleagues from and act accordingly." Their decisions are made these. Out of a sense of decency and because Zermatt and elsewhere.

Aufdenblatten (left) and Lehner with their helicopter and the Matterhorn.

thousands of lives. Even miracles happen some-



"Weather conditions may change so rapidly that Giving up means when plans A, B and C have not times. "I remember this man, already dead when sometimes I couldn't hook onto a helicopter that worked and the weather or nightfall prevent a we arrived, recalls the pilot. He wasn't breathing had landed me five minutes earlier." says Lehner. plan D. Temporarily suspend the operations and any more. I watched the doctor trying to resusci-More than once, the rescuer has felt very small search, even if this might mean the worst for the tate him for 30 minutes. In the end, it worked and the man had no aftereffects, which is incredible."



### **Richard Lehner**

born in Zermatt, 44, married with two children.

At work: rescue specialist for Rettungsstation Zermatt, mountain guide, snowsports teacher.

more than 360 mountain rescue oper-230 climbs to the top of the Matterhorn expeditions in North and South America, 14

tain Sabin Basnyat, they managed to save three climbers stranded on Annapurna at 7000m. This As they are leaving the Monte Rosa hotel, a lady was judged to be an impossible mission, until turns back and whispers to the boy with her: then the highest helicopter rescue operation in "Did you see who that was? Those are the two history (see page 15).

For two months, it remained almost confiden- Their passion, experience and good luck have ten. Then the Zermatt tourist office published heroes of their childhood dreams. the story, which sounded good for their image. The "news" was repeated by the local press. "Then everybody went crazy about it", Lehner is still amazed. National press, radio and TV interviews, world press and specialist magazines. Straight afterwards, they received several international awards.

In March 2011 the two Swiss experienced the culmination of this unexpected stardom. They received the prestigious "Heroism Award", considered as the "Oscar of international civil aviation". The same as the one that had been awarded to "Sully" Sullenberger, the pilot who landed his damaged Airbus A320 on the Hudson in New York, saving the lives of his 155 passengers and crew.

Being in the spotlights a year after their rescue operation seemed guite unreal to the two rescuers from Zermatt. Especially as their fellow prize-winner Sabin Basnyat is no longer with them: one of the most experienced pilots from the Himalayas, who had become a friend thanks to all their cooperation in Switzerland and Nepal, was killed four months earlier. His helicopter crashed during a rescue mission on Ama Dablan, not far from Everest.

Lehner and Aufdenblatten shake their heads in disbelief, leave the applause of Washington behind them, return to Zermatt and the present. "This period was a bit crazy", says the pilot.

Fame has its good sides, but it is unlike their profession, requiring calm and control, or the culture of this alpine valley. Flying, climbing, saving lives, living intensely with the mountains – and going home to one's family in the evening. "What more could you want?"

Evening starts falling on the village. Mist has risen again over the Matterhorn. Are any climbers up there? Maybe. Are they in danger? Maybe. Luckily, some of the world's best specialists are there to help.

In April 2010, whilst they were in Nepal teaching They laugh and hug: the rescuer and the pilot their techniques, together with Fishtail Air cap- say goodbye. They will soon meet again at work.

guys who rescued the people in Nepal..."

tial, "which suited us fine", adds Aufdenblat- made Lehner and Aufdenblatten become the

Lehner on the "long-line".

Photo: Menno Boermans





One morning in April 2010 on Annapurna. "We were in Nepal to train a Fishtail team A team of six climbers (three Spanish, a on long-line rescue and we were alerted as Romanian and two Nepalese Sherpas) are in we were coming back from exercises at Evera critical situation. They have reached the 10<sup>th</sup> est base camp," tells rescue specialist Richard highest summit of the world - at 8,168m - the Lehner. "We didn't know exactly at what altiday before, but the weather deteriorated and tude the climbers were, adds the pilot Dantheir descent became a nightmare. They are iel Aufdenblatten. We just knew that it was now stranded at their camp 4. very high." Higher than 5800m, record altitude until then for helicopter rescues. May-Cold, fatigue and altitude have started to se- be even higher than the 7000m authorized riously weaken the Europeans. Even worse: maximum limit for Ecureuil AS 350 B3 Fishtail they have just lost radio contact with one Air helicopters.

the local rescue company.

Aufdenblatten takes off, Lehner waits to be lifted.

## SUSPENDED AT 7000M ON A RESCUE

of the Spanish climbers who they left 500m

higher up, exhausted because of lack of oxy- At this altitude, low air density reduces the gen and altitude sickness. They alert their suppower of helicopters and non acclimatized port team at base camp who call Fishtail Air, pilots and rescuers might risk acute mountain sickness (see page 17). Not to mention unstable winds that can push the helicopter into the rock face.



Suspended for 10 minutes in thin air at 7000m

> "We could have said "It's impossible" and re- blatten has this stomach-tightening doubt: fused to go. No one would have blamed us." the winds, the weight of the two men "and However, the two Swiss are on the spot and something else I couldn't identify, explains the they are amongst the best specialists in the pilot. I had a bad feeling so I cancelled the resworld for this type of rescue. "So, we decided cue right away". He informs the rescuer and to go and see and try."

> Together with Sabin Basnyat, captain of Fish- Back at base camp, it turns out that the pilot's tail Air and a doctor, they fly out to the Annap- instinct has allowed them to avoid the worst: urna base camp, 160km away. Upon arrival at as the approach took a long time, Lehner had 3 p.m. Annapurna is covered in mist, as usual only 10 minutes' oxygen left. Had he stayed up at this time of day. They have to wait until the there, mountain sickness would have taken yet next day. The climbers have to spend another another victim. The rescuer picks up another night up there at -10 degrees °C.

> Early next morning the weather has cleared up. ing his oxygen properly. Very quickly, he feels Two of the climbers have gone up to look for the first effects of altitude sickness. This time their companion, in vain. The missing climber it is he who tells the pilot to stop the operais thus first priority for the rescuers, even if the tion. Back again to base camp.

chances of finding him alive are now minimal. The helicopter takes off and is searching for the Spanish climber for about twenty minutes, without success. On the other hand, the survivors' camp is found. "The mountain side was sheer, remembers Aufdenblatten. The strong gusts of wind threw the helicopter in all directions, so no chance of landing near them." Back to base camp.

Once the winds subside, Sabin Basnyat and the two Swiss decide to try out something that had never been done before at this altitude: a long-line rescue. The helicopter is then emptied to the greatest possible extent to make it lighter and therefore slightly more powerful. Aufdenblatten takes off once more.

"I am hanging thirty meters under the helicopter, remembers Lehner. I just have an oxygen tube in my nose. Fishtail Air got real masks only a vear later." There he is swinging above one of the highest mountain ranges of the world. The flight to the climbers takes ten minutes. The temperature is well below zero and the rescuer moves his arms and legs to try to keep warm.

Upon arrival Aufdenblatten struggles with his machine's lack of power and against the winds to land the rescuer. The helicopter gets almost out of control. A single bad manoeuvre could send his friend crashing into the mountain side. At every swerve Lehner is swinging like a pendulum and the pilot needs to stabilize him. The minutes tick by when at last the rescuer manages to land on Annapurna and gets ready to unhook himself. Suddenly, Aufdenpulls on the controls to leave

oxygen kit and takes off again. Under the helicopter, the winds prevent Lehner from breath-

### Mission accomplished for Lehner (left), Basnyat (centre) and Aufdenblatten.



Time is passing, the mist will soon lift. At camp 4 the European climbers – less acclimatized than the Sherpas – are suffering from frost bite and altitude sickness worsens. It's not sure that they can hold on for another night up there.

A new plan is drawn up, Sabin Basnyat and the two Swiss immediately inform the climbers: the pilot will go alone, they will have to hook themselves onto the long-line.

The three men are aware that this plan is against the established safety rules and processes. An experienced rescuer in perfect physical condition must participate. Sick and weak climbers should never hook themselves on their own. They will be blamed afterwards for this operational decision. For the moment, the specialists have assessed their decision. "Our only other alternative would have been to abandon them" explains Aufdenblatten. "We had judged that we could take this risk in order to save them", says Lehner.

So the pilot takes off alone and the rescuer explains to the climbers over the radio what they should do. On the spot, the pilot's full experience is put to the test: concentrate, stay calm, keep the helicopter still, keep the blades away from the rocks, bring the weighted harness close to the climber without knocking him out or unbalancing him.

It works: the first Spanish climber, helped by his Romanian colleague, hooks himself on. Aufdenblatten guickly takes off. Ten minutes

later, the survivor is taken care of in base camp. The pilot takes off again. Up there, the two Sherpas refuse to try this nerve-wracking evacuation and prefer to stay with the equipment (they will manage to go down by themselves the day after). So the pilot evacuates a second European. He then goes back to pick up the last one

Back at the base camp, he can at last stop the engine of his Ecureuil, shortly before the mist covers Annapurna again. One climber is lost, but his three companions' lives are saved. The "Mission impossible" has been accomplished: Daniel Aufdenblatten. Richard Lehner and Sabin Basnyat have successfully completed what was then the highest helicopter rescue in history and what remains the highest lona-line rescue.

Today, just like in 2010, the two Swiss keep repeating: "That day on Annapurna, we did not *beat a record – we just did our job.*" Heroes to the end.

### Altitude: hazardous for both humans and machines

### For humans

ed by adequate acclimatisation.

can be treated with medicine or oxygen. to 7000m. Other symptoms include nausea, dizziness,

descend below the level at which the signs may happen rapidly.

### For machines

Acute mountain sickness is caused by the At very high altitude air density is signifihuman body's difficulty adjusting to reduc- cantly less than half of what is measured at tion in atmospheric pressure and oxygen sea level (30% at the top of Everest). The density. It occurs within a few hours when helicopter rotor blades do not have much to the ascent has been too guick. It depends "press against" and the helicopter's powon the person and can be reduced or avoid- er is drastically reduced. For example, a helicopter capable of lifting 1300kg at sea level could take only 500kg to the summit Headache is the first warning sign, which of the Matterhorn (4478m) and only 100kg

disturbed sleep and fatique. Mountain sick- This is why every single kilo counts for high ness may affect the reflexes and concen- altitude rescuers and the machine is emptration of a rescuer soon after arrival on the tied of everything that is not absolutely necscene, since there is no time for acclimati- essary. The positive aspects are that thanks ers (or hikers), must stop their ascent and than in the Alps or the Rocky Mountains.

provoke a more severe condition of cerebral altitude, the engine stopped and the pilot second counts for the rescuers, since death est successful autorotative descent in hisplay the role of a parachute).



The REDEL brand is a benchmark for medical connectors. Situated in the heart of a Swiss region well-known for its precision machining and technological know-how, the LEMO Group's **REDEL** factory manufactures high-end connectors for major leaders in this demanding market.



from the reliability of REDEL connectors. In fact,

cations. These connectors are used by interna-

unique characteristics. They are lightweight, re-

where technology is literally vital.

ity. On the contrary: connectors are manufac- unit of Hermès Précisa, an office machine mancycles, i.e. 10 to 20 times more than polysul- much active (see page 21). phone. Five times lighter than steel, these plasheat, are allergen-free and can be coloured."

tics offer further advantages: they do not retain Turnover has multiplied by four since the early nineties, thanks to significant and regular investment as well as operational excellence via Last year, the new SP series connectors made continuous improvement processes. There has their debut in the REDEL catalogue, which in- been spectacular progress from the technocludes thousands of part number options. The logical point of view as well. Where five or six culmination of REDEL's expertise, they are ultra operations were necessary to make one part, they provide vital links between patients and resistant and innovative with a new patented a single operation is sufficient today. Product medical equipment in hospital rooms, operating Push-Pull system. They integrate 22 contacts quality has never ceased improving: reject rate theatres as well as a multitude of other appli- (instead of the previous 14) in a section of 14mm. has dropped to 0.5% of the turnover, compared to an average of 6% in the mechanical industional leaders in the field, mostly Americans, SP connectors are used in the fields of medi- try. Production time and leadtimes have been supplying equipment to hospitals in more than cine, electronics and test & measurement in- drastically reduced, for example from 12 weeks 80 countries. They are a reference in this sector, struments. Their exceptional specifications are for 100,000 contacts 15 years ago to 10 days the result of two years of development as well today. Consequently, 99% of REDEL products as joint research by REDEL's plastic injection are delivered to the supply chain on time -The success of REDEL connectors is due to their mould specialists and LEMO's R&D team. very Swiss!

sist to extreme temperatures between -50 and REDEL makes 50% of its turnover with medical +170 degrees °C (so suitable for sterilization) connectors. The other half comes from working and identified by colour coding. The connec- for the LEMO Group. All the know-how, exceptions are secured by means of mechanical key- tional skills in miniature manufacturing as well ways preventing the connection of a patient to as high performance machines, sometimes spethe wrong device. All components must meet cially developed for REDEL, are at the Group's the highest requirements to ensure a reliable entire disposal. The factory produces metal

keeps finding solutions to be able to push the tion moulds being close to 3 microns.

high quality Push-Pull connection. Connectors parts for the LEMO Group (contacts for all conneed to have high contact density: "The tech- nectors, niche products made of stainless steel nological challenge is to fit the highest number and titanium for professional high definition TV of contacts in a small section - says Abraham cameras, nuclear applications, the automobile Ratano, REDEL's director. It is also to include hy- sports industry as well as aeronautics). REDEL brid fluidic connectors which can carry gas or also provides various tooling (moulds, dies, asliquid in addition to electric signals." The team sembly fittings and control devices).

limits of miniaturization, the precision of injec- REDEL (Reprise et Décolletage LEMO = LEMO's precision machining centre) was born in Sainte-Croix, a small Swiss town, in 1986, when LEMO With REDEL, "plastic" does not mean low gual- acquired the moulding and screw-machining tured in high-tech materials, in polysulphone ufacturer that had gone bankrupt. "They had and, even better, in polyphenylsulphone, a com- excellent know-how in micromechanics and pound that didn't exist 25 years ago. "It is the mould production", explains Abraham Ratano. BEST, says Abraham Ratano with enthusiasm. The company could thus benefit from long-es-Polyphenylsulphone resists to 1000 sterilization tablished local high technology, that is still very



### THE LAND OF "SWISS MADE"

Sainte-Croix is located in the Jura Arc, a region (machine-tools), Mikron (assembly soluthat stretches from Geneva to Basel, making up tions), Etel (micro-engines), Bien-Air (denthe Western border of Switzerland. This area tal and surgical equipment), Bumotec and has greatly contributed to the Swiss certifica- Willemin-Macodel (high-range machining tion of origin "Swiss made", a quality label rec- centres). Today, many start-ups continue to ognized worldwide. emerge, namely in micro-technology.

Sainte-Croix, home of REDEL, in the Swiss Jura mountains.

well-known all over the world.

highly qualified skilled workers have also ers in other fields than watch-making: Tornos quality connectors.

It all started with watch-making. In this hilly ag- Sainte-Croix entered its golden age in the 18th ricultural area, farmers had found an unusual century with watch-making. Then as of the way to spend long winter months: watch-mak- 19th century, the small town has become the ing. These generations of watch-making farm- world capital of music boxes: up to 600 workmost all major Swiss watch manufacturers, now singing birds and automats that were very fashionable in wealthy people's homes. Precision mechanical industry then provided high quality Deeply rooted in regional culture, the love phonographs, gramophones, cameras, radios



22

		r oddbau	0								
MOUSER ELECTRONICS.			Part # / Keyword				٩	Stocked		Log In Create Account Order History Subscription	
Products	Manufacturers	9.	Арр	olications	8	Services &	a Tools	Catalog	Help	Online Catalog	
RODUCT FINDER	a.	Home » A	All Product	is » All Mar	nufacturers	» LEMO				ecia	
NEWEST PRODUCTS	<b>()</b>										
Ircuit Protection onnectors lectromechanical		Visit LEMO Website					Search LEMO Part No	umbers Search			
nclosures ngineering Tools	osures			View all	EMO Pro	ducts		View LEMO NEWESTPRODUCTS			
dustrial Automation ED Lighting		About LEMO	Product Listing	New Products	Featured Products	Resources & Support					
ptoelectronics assive Components ower amiconductors ensors ast & Measurement hermal Management		LEM man robu quali med	O, a Swis ufacture o st owing to ty and reli ical, broad	s owned co f high qual to the "Push ability and loast, test a	ompany, wa ity precision I-Pull" self-l LEMO conr & measuren	s established i a custom conne atching system nectors can be nent, aerospac	n 1946 a oction sol , invente found in e, autom	and continues to be a global leader in the lutions, LEMO connectors are exception and by LEMO's founder Léon Mouttet. L many challenging and life saving appli- notive and industrial.	he design and mally reliable and EMO is known for lications including	r their C	

A MINE **OF NFW DEAS** Headquartered in Dallas/Fort Worth, Texas

(USA), Mouser Electronics is a global leader in the distribution of semi-conductors and electronic components. Mouser's success comes not only from its vast product selection and outstanding response rate, but also from its professional vision: to help design engineers innovate.

1964 in the USA, Mouser is today the favourite serving engineers and buyers, Mouser Electrondistributor for design engineers and buyers all ics does not require a minimum order and will over the world. With a presence in 20 countries, even ship a single part if the project requires it. from Mexico to Singapore, from Germany to France, Hong Kong and Taiwan, Mouser Elec- Mouser's greatest strength is also to anticipate tronics is anything but electronics' supermar- its customers' requests. The company is conket. It's rather a partner to innovation.

In order to reach this goal, Mouser Electronics It provides new product information, advice, proposes an immense line card with millions of descriptions to its customers and visits its key references, all available on its website Mouser. manufacturers on a regular basis to learn about com. There is a wide range of semi-conductors, the new product introductions. Its global presconnectors, passive filters and other electro- ence makes it possible to answer all requests in mechanical components. The distributor spe- many languages across several continents. cializes in carrying the most recent and technologically advanced parts. In other words, As for the future, Mouser Electronics is planning exceptional resources for all those who would for continued growth. Not only geographical, like to manufacture a product quickly and test by expanding its offices and distribution centre, it in real conditions.

yet present.



times and small quantities be found?

Thanks to its global presence and extended customer network, including some of the world's largest companies, Mouser Electronics gives its suppliers the opportunity to reach industrial leaders on markets where they are not

In the design phase, engineers often need small In addition to Mouser's wealth of inventory, quantities of electronic components to build there is an extraordinary response time. In most prototypes to test their product designs. Where cases, orders received by 8pm CST (US) can can these specific components with short lead be shipped out the same day from Mouser's state-of-the-art distribution centre, to arrive in Europe and Asia in just a few days, no matter Mouser Electronics is the answer. Founded in how small the order may be. Specializing in

> stantly seeking the latest components, always monitoring the most advanced technologies.

but also technological, by constantly meeting new requirements. In this age of miniaturi-This preferred choice is also a great advan- sation, where new wearable devices, such as tage for suppliers such as LEMO, who can use smart watches arrive on the market, there are this outstanding showcase for their products. countless innovation opportunities.

## **STUDENTS ON THE** HIGH-TECH FAST TRACK



Design and build your own racing car and then compete on famous race tracks. This is the technological adventure involving students from prestigious universities. It is called Formula Student and a Swiss team have obtained brilliant results.

Everybody knows Formula One Grand Prix Weighing 168kg with four 3.4kg motors (one races, but have you already heard about on each wheel), accelerating from 0 to Formula Student? This racing championship, 100 km/h in 2.2 seconds: the performance of reserved for students, hosts real gems of tech- the vehicles designed by AMZ racing team nology designed at major technical universities is simply amazing. For this purpose AMZ of the world (Stuttgart, Toronto, Bath, Florence, Racing Team uses a tried and tested method, Georgia Institute of Technology...). improved from year to year.

The special feature of Formula Student is that it First of all, they use ultra-light materials, such not only makes the cars compete against each as compact 19-pin connectors or the carbon other, but also rewards their design quality. The fibre monocoque chassis on the race car. competition is split into a static part, where Further, the key components of the car, like the applied technologies and profitability of the engine or aerodynamic elements are all the project are evaluated and a dynamic part, designed in-house and therefore optimised where road performance is tested on a 22km for this type of car. endurance race, an acceleration contest, a one lap autocross race and a figure 8 skidpad. The strength of the AMZ Racing Team is all

Among the most prominent race teams, supported by a solid network of Swiss and one particularly stands out by its innovative European partners. approach and technological prowess. Founded in 2006, AMZ Racing Team consists of 30 me- Success came guickly: last year AMZ Racing chanical and electric engineering students Team won first place overall at the prestigious from the Swiss Federal Institute of Technolo- Silverstone Race. In 2014 they went even further gy (ETH) Zurich and the University of Luzern, by winning three out of four Formula student races that they competed in. in Switzerland.

After having participated in Formula Student AMZ Racing Team's great adventure is far with combustion engine-powered cars, AMZ from over. Every year a new model is designed Racing Team decided in 2010 to focus entirely and new challenges are taken up. For students on electric power. This decision was motivated joining the team, this is a fantastic opportuby the considerably wider technical possibilities nity to combine theory and practice, dreams open to this type of vehicle. and reality.



the united competence of a team of 30,



Since 2010 the United States have banned the use of conflict minerals. This legal provision, introduced through the Dodd Frank Act, did not take LEMO by surprise. On the contrary, it justified the responsible procurement policy that the Group has been applying for a long time.

lethal conflicts.

For companies (and their countries), using these raw materials raises ethical guestions as much As far as responsibility is concerned, the elec- importance of recycling in industry. "At LEMO as it affects their image. So, unsurprisingly, tronic industry has been a pioneering force in we have always recycled all our waste, rejects various initiatives have been taken in view of establishing in 2004 the Electronic Industry and used plating baths containing gold. which banning conflict minerals. Among them, a spe- Citizenship Coalition (EICC) to create an ethi- are then returned to our supplier for casting. cial provision of the Dodd Frank Wall Street cal, social and environmental standard applica- This form of circular economy helps to avoid Reform and Consumer Protection Act adopted ble to the supply chain and the entire sector. *depletion of resources and at the same time the* in 2010 by the USA. It imposes on companies The Conflict Minerals Reporting Template of need to find other supply sources which could registered with the Securities and Exchange the EICC has been an integral part of the LEMO be in conflict zones. The ecological dimension Commission to define and disclose if they use supplier qualification process. conflict minerals.

This traceability requirement can be a conun- where they procure their materials from and drum, especially for companies purchasing provide a detailed description of the measures components from various suppliers around the taken to prove that they conform with the Dodd world. This wasn't a problem for LEMO.

In fact, LEMO manufactures its connectors in- basis. Moreover, foundries are subject to a vast house. This is the strategy aimed at total prod- certification process by the EICC and to regular uct quality control based on its corporate social, independent audits." environmental and ethical responsibility policy. For its raw materials, LEMO only uses reliable According to the specialist, acknowledged suppliers, most of them based the Dodd Frank Act has raised in Switzerland or in Europe. These suppliers, in awareness in industry in genturn, apply a responsible policy.

Consequently, the Dodd Frank Act did not cre- the quantity of gold extracted ate major turmoil for LEMO, even though all its in the DRC is estimated to be connectors contain gold (gold-plated contacts) less than 1% of the global anand tin is used in some alloys, such as bronze nual production. or brass.

"When the Dodd Frank Act came into force, aware of the importance of we already knew that we were not using con- responsible procurement and flict minerals, even if we had not formally creates more transparency in documented this process, points out Violaine industry." This is LEMO's con-Ramel-Schmid, LEMO's environmental manag- clusion based on customer er. The Swiss foundry that supplies our gold has requests: "In 2011 only a few

Conflict minerals: a sinister description of gold, been monitoring the origins of their supplies. American customers required that we prove tantalum, tungsten and tin originating from for a number of years. They clearly confirmed conformance with the Dodd Frank Act. Since the Democratic Republic of Congo and its that they were not supplied by the Democratic 2013 most of our global customers have reneighbours. These minerals come from mines Republic of Congo. As early as 2005, they have quested the duly completed Conflict Minerals controlled by armed groups that finance local even stopped all procurement from Uganda, Reporting Template, including more and more the only neighbouring country where they used detailed questions." to buy gold."

"This act makes companies

"Every supplier must make a list of foundries Frank Act, explains Violaine Ramel-Schmid. This questionnaire is updated on an annual

eral with regard to the issue of conflict materials, even if

The Dodd Frank Act also supports indirectly the is therefore closely linked to ethical and social aspects of our supply chain."





Exactly 50 years ago, LEMO inaugurated its first foreign subsidiary in Milan. Today LEMO is a renowned global leader. What was the driving force of this development? Undoubtedly the quality of LEMO connectors, but also human relationships.



▲ Walter Straessle (left) and CEO

at a directors' meeting

Marcello Pesci (the current CEO's father)

international sales.

At the end of 1965, the company celebrated its first one million annual turnover. In the fol- The human dimension has played a key role lowing years, Walter Straessle put up large in LEMO's development, believes Judit Spoposters in the Morges offices with the targets: erli, assistant to the CEO. "LEMO makes me "Two million, three million... we stopped at five! think of Switzerland: this discussion is pos-We wanted to show people what they were sible because LEMO knew how to stay small working for."

### LEMO IN THE WORLD

MILAN	PARIS	<mark>OSLO</mark>
Italy	France	Norway
1964	1988	2001
MUNICH	BUDAPEST	BROMMA
Germany	Hungary	Sweden
1969	1991	2002
VIENNA	<b>TOKYO</b>	<mark>SHANGHAI</mark>
Austria	Japan	China
1970	1994	2004
ROHNERT PARK	BARCELONA	HONG KONG
USA	Spain	China
1972	1995	2004
WORTHING	GENTOFTE	HEEMSKERK
UK	Denmark	Netherlands
1972	2000	2005

of production was sold on "Mister LEMO". the Swiss market.

1965, played a major role in a wooden cabin in Berkley. in the international expan-

> SINGAPORE Singapore 2010

**RICHMOND HILL** Canada 2012

OSCEOLA USA 2014

In 1964, LEMO was a mod- The sales director became the face of the est family company with a company abroad and built up a solid network staff of 32 and all its prod- in Germany, France, England and throughout ucts were contained in a the world. In 1972 he represented LEMO at catalogue of a few pages. Japan Airlines, who launched a flight to Tokyo The company counted on via the North Pole. The Swiss company's cona handful of customers. At nectors have been distributed since 1973 in this point in its history, 95% Japan, where Mr Straessle became known as

It was also in 1972 in California that he made Walter Straessle, sales di- the acquaintance of Bob Wersen, the founder rector, who joined LEMO in of Panel Components, a small company located

sion of the company un- Walter Straessle wanted to appoint him to reptil his retirement in 1996. His long career and resent LEMO products in the USA: "In order to LEMO's increasing growth started off with a convince Léon Mouttet to invest in California I crucial dialogue with the founder Léon Mouttet. had to make the most expensive phone call in "I told him that we had to export more in order my life! At the time everything was still centred to promote growth! At the time we depended around the East Coast," he recalls. Panel Comon three or four Swiss customers. Had we lost a ponents later became Interpower Corporation, single one of them, it would have ended it all!" a global leader in the field of electric compo-His advice was followed and LEMO launched nents. Mr Strassle's intuition confirmed to be the right one: with the rise of Silicone Vallev California became indispensable.

> enough to be able to focus on quality and human relationships, even on an international level. This maintains confidence and encourages creativity. LEMO will never become an impersonal multinational giant." Serge Buechli, marketing manager confirms and maintains this philosophy: "As Mr Walter Strassle used to say, there are no small or big customers. If you contact LEMO to buy one single connector, you will not be redirected to a distributor. We will sell it to you. It may be the start of a long story."

> Human relationships have brought success to LEMO. Today the company employs a staff of 1500 all over the world. Products are manufactured in Switzerland, Germany, Hungary and the USA. The catalogue presents a range of 75,000 connector combinations. Through almost 100,000 customers in more than 80 countries, LEMO sells 95% of its products abroad, which is the exact opposite of 1964. |

Designed to resist the harshest environments



### HEADQUARTERS

LEMO S.A Tel: (+41 21) 695 16 00 info@lemo.com

### SUBSIDIARIES

AUSTRIA

JAPAN LEMO ELEKTRONIK GESMBH Tel: (+43 1) 914 23 20 0 LEMO JAPAN LTD Tel: (+81 3) 54 46 55 10 sales@lemo.at lemoinfo@lemo.co.jp

NETHERLANDS / BELGIUM

info@lemo.nl

NORWAY / ICELAND

info-no@lemo.com

SINGAPORE LEMO ASIA PTE LTD Tel: (+65) 6476 0672 sg.sales@lemo.com

SPAIN / PORTUGAL

IBERLEMO SAU Tel: (+34 93) 860 44 20 info-es@lemo.com

SWEDEN / FINLAND LEMO NORDIC AB Tel: (+46.8) 635 60 60

LEMO VERKAUF AG Tel: (+41 41) 790 49 40

LEMO UK LTD Tel: (+44 1903) 23 45 43 lemouk@lemo.com

Tel: (+1 707) 578 88 11 info@lemousa.com

NORTHWIRE INC Tel: (+1 715) 294 21 21 cableinfo@northwire.com

ch.sales@lemo.com

UNITED KINGDOM

USA

info-se@lemo.com SWITZERLAND

LEMO NORWAY A/S Tel: (+47) 22 91 70 40

LEMO CONNECTORS BENELUX Tel: (+31) 251 25 78 20

CANADA LEMO CANADA INC Tel: (+1 905) 889 56 78 info-canada@lemo.com

CHINA LEMO ELECTRONICS (SHANGHAI) CO.LTD Tel: (+86 21) 5899 7721 cn.sales@lemo.com

DENMARK LEMO DENMARK A/S Tel: (+45) 45 20 44 00 info-dk@lemo.com

FRANCE LEMO FRANCE SÀRL Tel: (+33 1) 60 94 60 94 info-fr@lemo.com

GERMANY LEMO ELEKTRONIK GMBH Tel: (+49 89) 42 77 03 info@lemo.de

HONG KONG LEMO HONG KONG LTD Tel: (+852) 21 74 04 68 hk.sales@lemo.com

HUNGARY REDEL ELEKTRONIKA KFT Tel: (+36 1) 421 47 10 info-hu@lemo.com

ITALY LEMO ITALIA SRL Tel: (+39 02) 66 71 10 46 sales.it@lemo.com

DISTRIBUTORS

AUSTRALIA JOHN BARRY GROUP PTY. LTD Tel: (+61 2) 93 55 23 80

BRAZIL RAIMECK INDUSTRIA E COMÉRCIO LTDA Tel: (+55 11) 55 24 58 21

CHILE TRIGITAL LTDA. Tel: (+56) 2 2235 08 35 info@trigital.cl

CZECH REPUBLIC MECHATRONIC SPOL. S.R.O.

GREECE CALAVITIS S.A. Tel: (+30 210) 7248 144 technical@calavitis.gr

INDIA PT INSTRUMENTS PVT. Ltd Tel: (+91 22) 2925 13 53 ptinst@vsnl.com

ISRAEL AVDOR TECHNOLOGY LTD Tel: (+972 3) 952 02 22 sales@avdor.com

NEW ZEALAND CONNECTOR SYSTEMS HOLDINGS LTD Tel: (+64 9) 580 28 00 sales@connectorsystems.co.nz

PAKISTAN ZEESHAN ELECTRONICS Tel: (+92 51) 444 99 45 zain.sheikh@ zeeshanelectronics.com

POLAND info@semicon.com.pl

RUSSIA SCS Tel: (+7 495) 223-4638 (+7 495) 997-6067

SOUTH AFRICA JAYCOR INTERNATIONAL (PTY) Ltd Tel: (+27) 11 444 1039

SOUTH KOREA SUNG SHIN I&C CO., LTD Tel: (+82 2) 2026 8350 mail@sung-shin.com

TAIWAN EVERHARMONY ENTERPRISE INC Tel: (+886 2) 27 07 00 69 ever.harmony@msa.hinet.net

TURKEY sales@maksavunma.com

UKRAINE Tel: (+380 44) 568-5765



info@lemo.com