

Top of the class connectors

Over a billion connectors from the Multi-Contact Solarline range have been providing reliable connections all over the world since 1996. This represents a PV output of over 120 GW – almost impossible to believe. Matthias Mack, Head of Photovoltaics at Multi-Contact, explains to PES how this important milestone was achieved in a highly volatile market environment.



Matthias Mack

PES: Welcome to PES, it's great to talk with you. Can you tell us something about the background of your company?

Matthias Mack: Thank you. Multi-Contact is a leading international manufacturer of electrical contacts and connection systems. The company was founded in Basel, Switzerland in 1962. We are involved in many different industries but we have been working in the PV sector for over 20 years.

PES: To date a total of 120 GW PV power has been installed worldwide with PV connectors from Multi-Contact. What does this figure mean to the company?

MM: We are extremely proud of it, naturally. This figure is simply staggering and unique. At the end of 2015, global solar power amounted to around 230 GW – over half of which came from systems with original Multi-Contact connectors. For us, however, the aspect of longevity is also key: PV systems with our connectors are intended not only to produce the fantastic result of 120 GW today, but also to provide constant power for years to come.

Our products could be described as the backbone of the system and if they are not in perfect working order, the system's performance can deteriorate dramatically within a very short space of time. Whilst photovoltaics are currently being intensely promoted worldwide, there is not much point in installing ever bigger PV systems if they go on to provide only 60 to 70 percent of their maximum power because second-rate products have been used.

Photovoltaics are an extremely important ally when it comes to achieving climate targets all over the world and we should not weaken their effect if it can be avoided.

The PV power we have achieved is therefore in principle a confirmation of our

customers' trust in our company and in our products: they see us as a market leader. We have amassed a great wealth of experience and been a pioneer since the early 1990s and achieved this outstanding result within the space of two decades. This is the best proof of the longevity and flawless performance of our products, some of which have been in use for 20 years. Evidence such as this from the field tells us so much more than any laboratory test ever could.

PES: What does this figure mean for the industry?

MM: It is truly unique. As a comparison, the biggest module manufacturers are currently at around 15 GW. We are thus making an important contribution to positioning solar energy as an alternative renewable energy source and over the longer term as the central source. At the same time, however, we are aware that cabling (connectors, junction boxes and cables) is just a small piece in the puzzle of a large PV system and accounts for less than one percent of overall initial costs. That said the most effective solar panels in the world are no good if top-quality cabling is not used to transport the power to where it is needed.

When it comes to evaluating the risks associated with the return on investment (ROI), this is still often considerably underestimated. So much can happen: increased contact resistance leads to less power and more heat, components and strings provide less output, they can fail, or there is the risk of a fire, resulting in increased costs for maintenance and spare parts. If we factor in these aspects over an operational period of 10 to 20 years, it becomes clear that in the long term, quality prevails.

These are also the key criteria when it comes to securing financing for a big PV

system: low risk and the highest possible ROI. This calls for reliable partners and products, not least in financial terms – and there is no better argument for underlining the bankability of our products than this 120 GW power achieved using our connectors.

PES: How have you managed to reach such a figure, which partners have you been working with?

MM: One reason is undoubtedly our focus on first-class contact with partners and customers. On top of this, we also boast over 50 years of core competence with MULTILAM. We identify trends at an early stage and have a systematic problem-solving approach. As a Swiss company, we naturally focus on quality and see ourselves as a true solution provider.

We also have our outstanding workforce all over the world to thank for the successful global presence of Multi-Contact. The cumulative effect of all of these factors has enabled us to set the standard – or benchmark – in the industry.

Back in 1996, for example, came the development of the first industrially produced connector designed specifically to meet the needs of a PV system. Initially, the leading manufacturers were from Japan and Germany, volumes were low and technical requirements were high. Later we collaborated with top players from throughout the industry and with research institutes, targeted partnerships and further product development.

We invested in regional and international capacity expansion at an early stage with a view to building up a global presence. Backed up by this solid foundation, we experienced the dynamic transformation of the industry with the best possible results, both from a technical and a geographical perspective.

Today we have a broad customer base in over 67 countries worldwide, ranging from module manufacturers through power inverter producers, EPC or developers to installers and resellers to whom we sell both our standard products and our customer-specific solutions.

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Matthias Mack

PES: When did the development away from a niche product and toward a mass product become a clear choice for Multi-Contact and what were the challenges involved?

MM: Trends in this direction were identified back in the early 2000s and then there was some extremely strong growth in the second half of the decade. The challenges included the trend toward standardisation, the evolving global markets and the significant price pressure combined with high technical requirements.

It was also interesting to observe how the market shifted from Europe to Asia and brought new business partners as a result. We had to keep pace with this growth and maintain control over investments. Notable aspects included the transformation into a commodity market, the drive toward design-to-cost and toward lower costs combined with enhanced features.

It was a logical consequence, then, that against the backdrop of this competition and price pressure, the focus was often no longer on top quality but on the principle of “good enough”. At the same time, however, it can also be said that photovoltaics have really established their place in public perception, thanks not least to cultural developments, the creation of local opportunities for production and the significant increase in the number of local competitors. Unfortunately there are copycat products and these are often of lower quality,

PES: Which particular factors have contributed to this development?

MM: Environmental issues have played a major role. Public awareness has increased considerably, with most people agreeing

that alternative energy sources need to be used. Financial factors – local incentive schemes, subsidies and the decline in cost for components – have also had an impact, as have the technical enhancement and efficiency of the systems.

The good results in terms of LCOE and grid parity are also attracting increasing numbers of investors. This positive dynamic is unstoppable and photovoltaics will clearly play a very significant role in the future of energy.

PES: What can you say about the quality and the longevity of your connectors and what are the possible impacts on these two?

MM: We are the only manufacturer with our own internal production facilities for PV connectors, which enables us to guarantee consistent material composition and standardised processes. In addition to this, we also use our own production tools.

The technical data concerning contact resistance and longevity has gone a lot further than is required for certification. We assess the longevity of our products under enhanced test conditions that go beyond the standard, also studying effects from ammonia and carrying out salt spray tests, for example.

Today’s market requirements have evolved on the basis of environmental issues and geographical diversity, but here too, experiences in the field are much more meaningful than laboratory results. And do not forget: 120 GW worldwide in the last 20 years!

Our products can be found in every corner of the earth – and in some very different, sometimes extremely tough, environmental conditions. Our products have extremely low

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failure rates (PPM). Problems can sometimes occur as a result of low-quality or recycled materials, for instance and as a result of poor contact quality. While this is ruled out in our manufacturing process, our products can of course be affected by external influences, including incorrect or poor assembly (especially when crimping) or a crossover connection.

A crossover connection is one in which our connector is combined with one from a different manufacturer. A large number of studies and a great deal of experience in the field in recent years have shown clearly that these different connectors are not compatible.

TÜV Rheinland has stated, for the purpose of clarification, that the use of two different connectors invalidates the certification of the individual products. This is not only dangerous, the increased contact resistance leads to a loss of power and in the worst case to heat build-up and fire, but also means that the product guarantees no longer apply and insurance companies may refuse to cover any damage.

In addition to this, the legal uncertainty when it comes to liability has a direct negative impact on the overall project bankability and the ROI calculation.

PES: What are Multi-Contact’s strengths and where does the company stand in an international comparison?

MM: Our connectors make us the undisputed “best in class” – the benchmark. We make no compromises on quality and offer enormous expertise based on over 50 years in contact technology and 20 years in the PV market.

What we also offer, is the best value for money over the long term, combined with the benefits of consistently available production capacity and the financial strength we enjoy as part of the Stäubli

Group. Our customers value our innovative solutions, the service orientation of our sales team and our strong and enduring partnerships in the PV industry throughout the entire value chain.

We also attach great importance to a sustainable approach and have high standards when it comes to our own intercultural understanding. Another clear benefit is our presence in the installation markets and in over 20 different countries with our own subsidiaries. These arguments make us an exceptionally reliable partner in the PV industry, both from a technological and financial perspective.

PES: Looking ahead, which developments or trends do you see approaching and what is Multi-Contact doing to maintain its role as market leader?

MM: We expect to see increased segmentation in the future, with standard modules for various areas of application and doubtlessly a large market for building-integrated photovoltaics, while classic PV will gradually merge with storage applications.

We anticipate continued strong growth in the USA, China, Japan and India; in particular. Also attractive growth markets also exist in the MENA region, South America and Southeast Asia. The central issues include cost optimisation and additional development of products – not least because of the increasing numbers of lenders and investors entering the industry who insist on high quality, sustainable returns and low risk.

We need to stay on the ball, focus on quality issues and respond to the increasing importance of operational and maintenance services. We can continue to consolidate our pioneering role through our work on expert committees and advisory panels.

For our customers, however, we will need to set ourselves apart from our competitors for example, by means of training opportunities and excellent service. This will also enable us to increase the innovation rate over the long term

PES: Where do you see the PV industry and the technology in 10 years’ time?

MM: The industry will continue to develop positively based on its growth and photovoltaics will become an increasingly important part of everyday life. Whether through integration in buildings, large centralised and decentralised PV power stations, or amalgamation with storage solutions – photovoltaics offers smart renewable energy.

PV is in the process of consolidating its role as a fixed component of primary energy production and will soon have established an even clearer role worldwide as a technology of the future. Global big players will advance into the industry and high-quality components will win out in markets driven by ROI and bankability. ■

www.mc-pv-portal.com

About the product:

The original MC4: Its excellent characteristics have made the MC4 - **MC = Multi-Contact** - the “de facto standard” for connectors throughout the world for over 12 years. The heart of every connection is the tried and tested stable MC MULTILAM technology, which guarantees consistently low performance loss throughout the service life of the connector.

The MC4 meets the conditions for the IP65 and IP68 degrees of protection and is approved for use within a temperature range of -40°C to +85°C (IEC and UL, 1500 V). The impact-resistant polycarbonate housing can withstand UV radiation, salt spray and ammonia vapours.