



Thomas Fröhlich, CEO of WORK Microwave ●●●

Established in 1986, WORK Microwave originally focused on a series of research projects and product design on behalf of other industry players. The company's initial strength involved creating clean clock sources. Key product areas included oscillators, synthesizers, and IF and RF frequency converter modules.

From 1992, the company expanded into designing, manufacturing and distributing its own product lines for OEM applications. WORK Microwave has expanded its product portfolio and vertical markets ever since.

## High-quality products and brand image

WORK Microwave was established in 1986 in Holzkirchen, Germany, to research and develop IF and RF frequency converter modules, synthesizers and oscillators on behalf of other industry players. From 1992, the company expanded into designing, manufacturing and distributing its own product lines for OEM applications. WORK Microwave has expanded its product portfolio and vertical markets ever since. Amy Saunders met with Thomas Fröhlich, CEO of WORK Microwave, to find out more about the company's market presence, and where it's looking next.

### Question: What products and solutions does WORK Microwave provide, and to which markets?

**Thomas Fröhlich:** WORK Microwave has four product divisions. The Satellite Technology division includes our analogue equipment, which provides around half of the company's turnover, as well as the digital product lines, including our modulators, demodulators and modems. The second division is Defence Electronics, and includes radar synthesizers and frequency generation synthesizers. Navigation Simulators is our third sector; our simulators work with GPS and Galileo, and we cooperate with a Munich-based company which provides the software for this equipment. The final division is Sensors and Measurements, which produces

signal sources or sensors based on RF resonance technology for density, mass or moisture analysis in the pharmaceutical and food industries.

We recently developed a new wideband modulator with a 500MHz and beyond range. We discovered that the market for these kinds of products is still very limited, and we believe strongly in the future of these wideband applications. Several our competitors are also working on similar products. We've also recently launched the new A-series platform, which has a modular design for DVB-S2X IP applications and enables more customisation for our customers.

### Question: Where does WORK Microwave see itself in the market?

**Thomas Fröhlich:** We're not the cheapest on the market, but we provide very high quality products. It's a major part of our brand image, and it's serving us well. Last year was our most successful yet in terms of revenue.

The company has a very strong RF competence, in both engineering and design. We are an extremely verticalised organisation; we still fabricate the housings for all our modules, and we do the full design, integration and testing ourselves. By having these competencies in-house, we are able to be extremely flexible for our customers; we can adapt our designs easily and quickly for specific customer needs.

For instance, if we have converters which are required in a multi-bandwidth



We're not the cheapest on the market, but we provide very high quality products. Photo courtesy WORK Microwave ●●●



operation, we can provide a solution faster than any of our competition.

The satcom industry is our bread and butter, and we're generally very optimistic on satcom sales in the near future, especially for our converters. We're also seeing an increasing number of requests for proposals (RFPs), many of which should evolve into contracts. My strategic concern is that our other three business divisions also need to grow.

Defence Electronics, in particular, must be opened up to reach a wider customer base. To do that, we first need to analyse the competition and market trends; this is an ongoing exercise, but we know that there's a huge amount of potential. We're launching actions on our products where we need improvement, and in areas where we need to enlarge our product portfolio. We're also developing our market position by attending more exhibitions, and we're expanding our distribution network with specialised focal points that already have the right customer base.

In our converter business, we have decided to enlarge our portfolio towards the lower-end of the market. It's a highly-disputed area in terms of price. The market is also demanding more reliable solutions for converters to be used along the equator, particularly in C-band.

Broadcasters, especially those active around the equator, want to use more reliable frequency bands to ensure a successful transmission. We're developing a more cost-effective solution for that market. On the digital side, we're continuing to extend the A-Series for wideband applications, using the technology we developed through research projects.

In other news, we've recently opened our US subsidiary, which for the time being is a small sales office. The initial results have been very promising. Being physically present in the US with a telephone number and address has helped a lot already in our development in that market. We've had good orders from new customers. We have high expectations on that front, and plan to build on it in the future.

**Question: The latest DVB-S2X standard was released in 2014, and is today becoming increasingly**

**ubiquitous on the market. How will this change the market for WORK Microwave going forwards?**

**Thomas Fröhlich:** As a technology leader, this is a positive change for us. We were an early adopter of DVB-S2X extensions, and a few of the products in our current catalogue (AR-60, SDM2, SDMw) were the first enablers for this technology.

DVB-S2X is not yet a mass market, but mainly test equipment/concept verification applications and some early adopters. In the near future, applications will move from test/concept to live operation on a bigger scale, and in the next two years, to the professional market.

**Question: How will the advent of 4K broadcasting affect WORK Microwave's business? What are your expectations of this market evolution?**

**Thomas Fröhlich:** This move does not affect us as such, as we are not responsible for content. However, we hope that it helps to enable DVB-S2X for the consumer market. Higher bandwidth demand despite better video encoding is always a driver for satcom.

**Question: In September 2016, WORK Microwave launched a series of Q-band frequency converters. How does the company expect demand for Q-band products to change in the coming years?**

**Thomas Fröhlich:** Q/V-band answers the market demands for higher bandwidth services. Commonly-used Ka-band will not have enough

bandwidth for future telecommunications services. Satellite operators will need to take different approaches, such as HTS and big LEO constellations.

The main problem to deal with from the operator's point of view is propagation impairments. More sophisticated fade mitigation techniques need to be employed, such as uplink power control, automatic level control, ACM, and site diversity.

**Question: What are WORK Microwave's expectations for 2017 and beyond?**

**Thomas Fröhlich:** We're discussing this heavily internally right now, as well as with external partners and competitors. One big discussion is whether IP-based systems are going to overtake classical video broadcast systems in the short to medium-term perspective. This would have a major impact on our digital product range. The major satellite operators have indicated that they still see a future in video broadcast, but clearly, we need to keep a close eye on this market evolution. It's important that we don't miss the transition.

The second big discussion, for us, is whether the IP-based telecommunications sector is going to expand as well. Again, that would have a big impact on our business. We believe that this trend will continue, so the big challenge for WORK Microwave will be to enter this market with the big system suppliers like iDirect and ViaSat. There are big question marks for all of us in the industry about what's going to happen in the next 5-7 years. 🌟

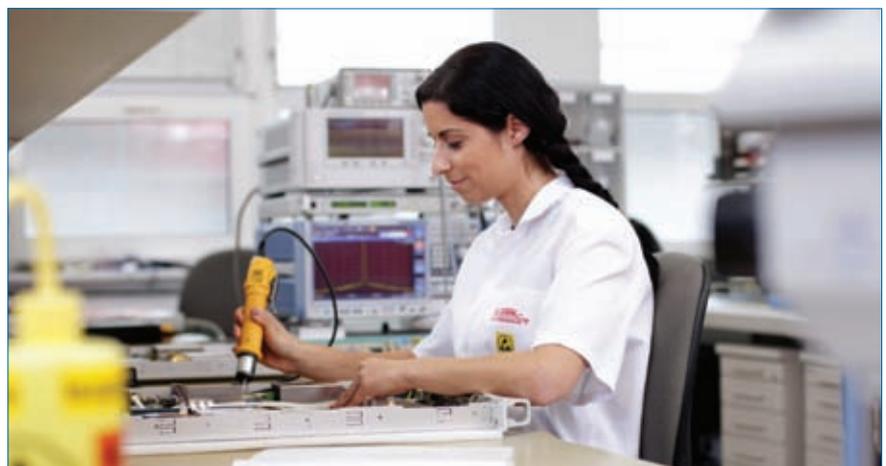


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