



2011 European Sensors New Product Innovation Award.





Frost & Sullivan's Global Research Platform

Frost & Sullivan is in its 50th year in business with a global research organization of 1,800 analysts and consultants who monitor more than 300 industries and 250,000 companies. The company's research philosophy originates with the CEO's 360 Degree Perspective™, which serves as the foundation of its TEAM Research™ methodology. This unique approach enables us to determine how best-in-class companies worldwide manage growth, innovation and leadership. Based on the findings of this Best Practices research, Frost & Sullivan is proud to present the 2011 Europe New Product Innovation Award in Radar Sensors to Novelda AS (Novelda).

Significance of the New Product Innovation Award

Key Industry Challenges Addressed by Product Innovation

An important challenge in the radar sensors industry emerges from the limitation that existing radar technology faces with respect to detecting near-field objects (0m to 2m). Moreover, currently available radar systems are primarily based on a swept focus principle, which means that the point of focus is swept over the distance range as a function of time. Therefore, while detecting small mechanical movements within a non-static object, it is difficult to distinguish between the movement of the non-static object and the minute movement inside the object. Moreover, in the medical diagnosis space, most of the medical measurement and monitoring devices are today either invasive or wired, which poses a challenge in terms of the need to develop radar sensors that can be used for noninvasive medical measurements and monitoring. Furthermore, the automobile sector poses challenges in terms of requiring a radar technology that possess the advantage of penetration into/around obstacles and high range resolution. To be successful in the market, the participants will have to develop products that effectively address these challenges.

Impact of New Product Innovation Award on Key Stakeholders

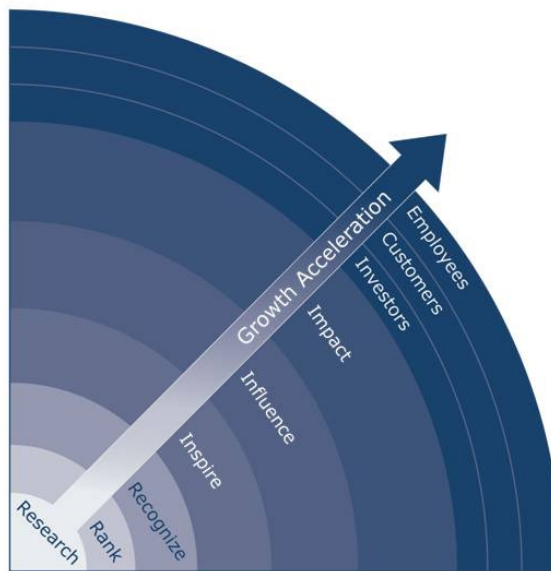
The New Product Innovation Award is a prestigious recognition of Novelda's accomplishments in the radar sensors market. An unbiased, third-party recognition can provide a profound impact in enhancing the brand value and accelerating Novelda's growth. As captured in Chart 1 below, by researching, ranking, and recognizing those who deliver excellence and best practices in their respective endeavors, Frost & Sullivan hopes to inspire, influence, and impact three specific constituencies:

- **Investors**

Investors and shareholders always welcome unbiased and impartial third-party recognition. Similarly, prospective investors and shareholders are drawn to companies with a well-established reputation for excellence. Unbiased validation is the best and most credible way to showcase an organization worthy of investment.

- **Customers**
Third-party industry recognition has been proven to be the most effective way to assure customers that they are partnering with an organization that is leading in its field.
- **Employees**
This Award represents the creativity and dedication of Novelda’s executive team and employees. Such public recognition can boost morale and inspire your team to continue its best-in-class pursuit of a strong competitive position for Novelda.

Chart I: Best Practices Leverage for Growth Acceleration



Key Benchmarking Criteria for New Product Innovation Award

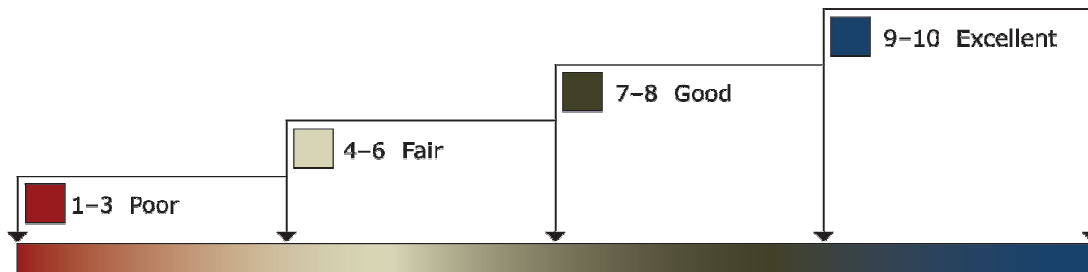
For the New Product Innovation Award, the following criteria were used to benchmark Novelda’s performance against key competitors:

- Innovative Element of the Product
- Leverage Leading Edge Technologies in Product
- Value Added Features/Benefits
- Increased Customer ROI (small change)
- Customer Acquisition/Penetration Potential

Decision Support Matrix and Measurement Criteria

To support its evaluation of best practices across multiple business performance categories, Frost & Sullivan employs a customized Decision Support Matrix (DSM). The DSM is an analytical tool that compares companies' performance relative to each other with an integration of quantitative and qualitative metrics. The DSM features criteria unique to each Award category and ranks importance by assigning weights to each criterion. The relative weighting reflects current market conditions and illustrates the associated importance of each criterion according to Frost & Sullivan. Fundamentally, each DSM is distinct for each market and Award category. The DSM allows our research and consulting teams to objectively analyze each company's performance on each criterion relative to its top competitors and assign performance ratings on that basis. The DSM follows a 10-point scale that allows for nuances in performance evaluation; ratings guidelines are shown in Chart 2.

Chart 2: Performance-Based Ratings for Decision Support Matrix



This exercise encompasses all criteria, leading to a weighted average ranking of each company. Researchers can then easily identify the company with the highest ranking. As a final step, the research team confirms the veracity of the model by ensuring that small changes to the ratings for a specific criterion do not lead to a significant change in the overall relative rankings of the companies.

Chart 3: Frost & Sullivan's 10-Step Process for Identifying Award Recipients



Best Practice Award Analysis for Novelda

The Decision Support Matrix, shown in Chart 4, illustrates the relative importance of each criterion for the New Product Innovation Award and the ratings for each company under evaluation. To remain unbiased while also protecting the interests of the other organizations reviewed, we have chosen to refer to the other key players as Competitor 1 and Competitor 2.

Chart 4: Decision Support Matrix for New Product Innovation Award

Measurement of 1-10 (1 = lowest; 10 = highest)	Award Criteria					Weighted Rating
	Innovative Element of the Product	Leverage Leading Edge Technologies in Product	Value Added Features/Benefits	Increased Customer ROI	Customer Acquisition/Penetration Potential	
Relative Weight (%)	20%	20%	20%	20%	20%	100%
Novelda	9.0	9.0	9.0	8.5	8.5	8.8
Competitor 1	8.0	8.0	8.0	7.0	7.0	7.6
Competitor 2	7.0	7.0	7.0	7.0	7.0	7.0

Criterion 1: Innovative Element of the Product

The Novelda Impulse Radar - NVA6000, is a cutting edge radar transceiver that incorporates extremely high frame rate and accuracy, in addition to unique penetration capabilities. Integrated on a single chip, this radar transceiver transmits pulses of high bandwidth. Based on the Continuous Time Binary Valued (CTBV) design platform, this CMOS impulse radar transceiver successfully eliminates bottlenecks prevalent in conventional digital design based processors. Unlike traditional processors, the NVA6000 Novelda Impulse Radar sensor does not involve the use of synchronous clock based digital designs. This enables significantly low power consumption while accelerating the processing speed.

Criterion 2: Leverage Leading Edge Technologies in Product

Since its inception in 2004, Novelda has shown a strong penchant for leveraging cutting edge technology and design concepts such as the CTBV design paradigm in its products. The CTBV design concept that eliminates the clock based design approach of traditional processors, leads to considerably lower power consumption while enabling performance gains in terms of speed. The clock-less CTBV design saves the entire energy that is otherwise used for clock driving or distribution. In comparison, synchronous clock based traditional digital technology consumes almost 50 percent of the total power, as noted in case of several conventional high end processors.

Criterion 3: Value Added Features/Benefits

In comparison to traditional technology the Novelda NVA6000 Impulse Radar transceiver offers several improvements and value added features. The Novelda radar emits very short pulses that is a very rapidly changing signal, and thus occupies a very wide bandwidth. This allows far more accurate measurement of absolute and relative distances, and thus resolution. Its exceptionally short pulse time enables very high accuracy distance tracking and even detection of static objects. In addition, spectral information of target reflectivity is retained by its many parallel radar samplers, enabling differentiation of targets based on the reflected pulse shape. It incorporates extremely high sensitivity which enables it to identify objects that are behind obstacles. This ability to see through obstacles enables it to cater to new applications. Unlike technologies that demand free visibility, Novelda NVA6000 Impulse Radar transceiver's ability to detect objects behind obstacles, eliminates the need of cleaning of lenses, thus ensuring cost savings. Moreover, it effectively uses even extremely short microwave pulses, which makes it befitting for high resolution ranging. Its high sensitivity enables it to detect very weak signals even in the middle of considerable noise. In fact, the Novelda NVA6000 Impulse Radar transceiver leverages Suprathreshold Stochastic Resonance while detecting extremely weak signals, during which the noise in conjunction with the signal in effect assists in increasing the signal-to-noise ratio. Moreover, it incorporates a staggered Pulse Repetition Frequency (PRF) of up to 100MHz. This addresses the problem related to maximum unambiguous range (MUR). MUR in simple radar systems is limited when the echo return time from a target is greater than the pulse repetition period. The ability to detect objects behind obstacles coupled with increased speed and sensitivity not only makes it complementary and/or a substitute for existing technologies such as ultrasound, video and infrared sensors, but enables it to cater to new areas of application as well. In addition, the Novelda Impulse Radar transceiver being integrated on a single chip enables it to be seamlessly integrated into small mobile devices.

Criterion 4: Increased Customer ROI

One of the primary objectives of Novelda is to ensure increased return on investment (ROI) for its customers, while developing and delivering cutting edge products for them. Advanced technological features of the Novelda Impulse Radar transceiver enables cost saving and brings down the cost of ownership by eliminating the need for maintenance of lenses as opposed to technologies that require free visibility. In addition, the company assists the developers and saves cost and time for them by supplying development kits and software, and providing development support for the entire range of available chips.

Criterion 5: Customer Acquisition/Penetration Potential

The state-of-the-art Novelda Impulse Radar transceiver, an extremely advanced electromagnetic high precision sensor, successfully caters to sensor applications across a range of sectors. These comprise of health monitoring (including stress and pulse monitoring), medical diagnosis (including heart beat monitoring and 3D RF-imaging), automotive and industrial (including distance and road obstacle detection), security surveillance (such as motion detection), and energy automation and defence. The highly advanced features of the Novelda NVA6000 Impulse Radar transceiver coupled with its ability to see through obstacles, high precision, sensitivity and speed that lead to cost savings, provides it with high penetration potential in the radar sensors market. Novelda is extremely confident of increasing its market share by supplying to both sensor developing companies as well as application developing companies.

Conclusion

The Novelda NVA6000 Impulse Radar transceiver, an extremely advanced electromagnetic high precision sensor integrated on a single chip, offers unique penetration capabilities while bringing down the cost of ownership for its customers. It incorporates advanced design and technology that successfully eliminate previously existing technological bottlenecks. This provides it with the ability to effectively cater to a range of sensor applications – in fields ranging from medical imaging to security and surveillance.

The CEO 360 Degree Perspective™ - Visionary Platform for Growth Strategies

The CEO 360 Degree Perspective™ model provides a clear illustration of the complex business universe in which CEOs and their management teams live today. It represents the foundation of Frost & Sullivan's global research organization and provides the basis on which companies can gain a visionary and strategic understanding of the market. The CEO 360 Degree Perspective™ is also a “must-have” requirement for the identification and analysis of best-practice performance by industry leaders.

The CEO 360 Degree Perspective™ model enables our clients to gain a comprehensive, action-oriented understanding of market evolution and its implications for their companies' growth strategies. As illustrated in Chart 5 below, the following six-step process outlines how our researchers and consultants embed the CEO 360 Degree Perspective™ into their analyses and recommendations.

Chart 5: How the CEO's 360 Degree Perspective™ Model Directs Our Research



Critical Importance of TEAM Research

Frost & Sullivan's TEAM Research methodology represents the analytical rigor of our research process. It offers a 360 degree view of industry challenges, trends, and issues by integrating all seven of Frost & Sullivan's research methodologies. Our experience has shown over the years that companies too often make important growth decisions based on a narrow understanding of their environment, leading to errors of both omission and commission. Frost & Sullivan contends that successful growth strategies are founded on a thorough understanding of market, technical, economic, financial, customer, best practices, and demographic analyses. In that vein, the letters T, E, A and M reflect our core technical, economic, applied (financial and best practices) and market analyses. The integration of these research disciplines into the TEAM Research methodology provides an evaluation platform for benchmarking industry players and for creating high-potential growth strategies for our clients.

Chart 6: Benchmarking Performance with TEAM Research



About Novelda

Founded in 2004 and based in Norway, Novelda is a fables semiconductor company. As an offshoot of the highly acclaimed University of Oslo, the company boasts of extremely strong research and development (R&D) and technological skills, and continues to leverage R&D partnerships formed with the university. For more information on the company please visit <http://www.novelda.no>.



About Frost & Sullivan

Frost & Sullivan, the Growth Partnership Company, enables clients to accelerate growth and achieve best-in-class positions in growth, innovation and leadership. The company's Growth Partnership Service provides the CEO and the CEO's Growth Team with disciplined research and best-practice models to drive the generation, evaluation, and implementation of powerful growth strategies. Frost & Sullivan leverages 50 years of experience in partnering with Global 1000 companies, emerging businesses and the investment community from more than 40 offices on six continents. To join our Growth Partnership, please visit <http://www.frost.com>.

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