

# JonDeTech Sensors

Mangold Insight – Commissioned Research – 2023-12-20

## Infrared sensors ramping up

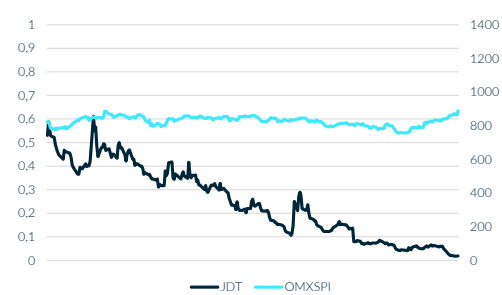
Mangold initiates coverage of the sensor technology company JonDeTech Sensors ("JonDeTech") with a Buy recommendation. The price target is SEK 0.10 per share over a 12-month period. The company has developed the JIRS30 sensor element, which is one of the world's thinnest IR sensors and only 0.17 mm high. The JIRS30 differs from traditional IR sensors in that it can be used in direct contact with objects, is flexible and does not require a protective cover, which is unique for JonDeTech. In addition, the company has sensors JIRS10 and JIRS40 in its product portfolio, which leads to several revenue streams. The products have multiple applications and can be integrated into a variety of products such as mobile phones, smart watches, smart patches, production facilities and batteries.

## Launches expected to give take off

Delivery of sensor JIRS40 will be done in the fourth quarter which will generate the first substantial sales. Mangold estimates that sales will begin to take off in 2024 given the commercialization of both the JIRS30 and JIRS10, which through an integrated solution is launched by a partner in Taiwan. Heat flow sensors are seen as the most interesting application according to Mangold, and the market is expected to reach about BUSD 2 by 2030. The growth rate is expected to reach 7.5 percent annually (CAGR), which gives JonDeTech the opportunity to take market share.

## Upside in stock

A DCF model has been used to value JonDeTech. A scenario analysis with different applied sales levels and return requirements has also been done. The valuation range amounts to SEK 0.047 to SEK 0.187 per share.



Price Performance %	1m	3m	12m
JDT	-66,6	-76,2	-96,8
OMXSPI	9,1	11,2	14,6

## Information

Price target	Buy 0,10
Risk	High
Price (SEK)	0,0188
Market Cap (MSEK)	19,7
Shares (Million)*	1 050,2
Free float	46,6%
Ticker	JDT
Next report	2024-02-21
Website	jondetech.se
Analyst	Pontus Ericsson

\*Excl. TO2 & TO3

Main Shareholders*	Shares	Capital
Avanza Pension	16,5	11,3%
Nordnet Pension	10,4	7,1%
Novel Unicorn L.	8,8	6,0%
Wiser Unicorn L.	4,6	3,2%
Bengt Lindblad	3,3	2,2%
Alexander Gavrin	2,6	1,8%
Lars-G. Berntson	2,2	1,5%
Swedbank F.	2,1	1,5%
<b>Total</b>	<b>145,8</b>	<b>100%</b>

\*Ownership structure as of 27 September 2023

Key Data (MSEK)	2022	2023E	2024E	2025E	2026E
Revenue (MSEK)	12,3	7,3	28,9	63,6	127,1
EBIT (MSEK)	-31,4	-38,9	-39,3	-26,9	4,6
Profit before tax (MSEK)	-36,8	-41,3	-39,3	-26,9	4,6
EPS (SEK)	-0,04	-0,04	-0,04	-0,03	0,00
EV/S	106,2	15,0	0,9	0,4	0,2
EV/EBITDA	neg	neg	neg	neg	2,6
EV/EBIT	neg	neg	neg	neg	5,6
P/E	neg	neg	neg	neg	5,4

# Investment case

## Infrared sensors ramping up

Mangold initiates coverage of JonDeTech with a Buy recommendation and a price target of SEK 0.10 per share in the 12 months term. This corresponds to an upside of over 200 percent. Mangold sees that JonDeTech has good growth opportunities given that deliveries of JIRS40 will begin and that JIRS30 is expected to be launched commercially in 2024. JIRS30's unique vertical structure gives it significantly more use cases than competitors products. In addition, it is thinner, allowing it to be integrated into more products, further expanding uses. Mangold sees that JIRS30 benefits will be able to lead to JonDeTech taking market share after launch.

*Price target SEK 0.10 per share*

## Numerous uses of IR sensors

For the JIRS10, JIRS30 and JIRS40 IR sensors, there are three main applications: Contactless temperature measurement, presence detection and heat flow measurement. It should be noted that only JIRS30 can measure heat flow due to its unique design and material properties.

*Wide range of applications for JonDeTech sensors*

- Contactless temperature measurement can be used for temperature monitoring in products, electronic installations, production facilities. At the same time, temperature can be measured contactless with mobile phone, as well as temperature in home and office.
- Presence detection can be used for wakeup function in electronic devices, for computers, and lighting control.
- Heat flow measurement can be used for contact-based temperature measurement in various wearables, smart watches and smart patches. It can also serve as an overheat protection in various products such as ball bearings, consumer electronics and batteries. Other uses include smart clothing, thermal control and automatic solar shielding.

Overall, JonDeTech's products have a wide range of applications, which Mangold believes will benefit JonDeTech's ability to grow.

## Rapidly growing markets

The market for IR sensors is expected to grow by 7 percent annually (CAGR) until 2028, to reach USD 751 million. In parallel, the IoT market is expected to grow by 14.8 percent annually (CAGR), where IR sensors can increase the efficiency of devices through activation of IoT devices. Heat flow sensors are the most interesting application according to Mangold and the market is expected to reach about USD 2 billion by 2030. The annual rate of growth is expected to be 7.5 percent (CAGR). The market for temperature measurement sensors is expected to reach BUSD 11.2 in 2032 with an average annual growth rate of 5.5 percent. JonDeTech is active in several fast-growing markets where it is expected to mainly take market share through its own developed sensor JIRS30.

*Fast-growing markets pave the way for growth*

## Full commercialization

Both the integrated product JIRS10 and the proprietary sensor JIRS30 are expected to become commercially available in the second quarter of 2024. It triggers significant revenue. In addition, the first deliveries of JIRS40 are to be carried out in the fourth quarter of 2023. Mangold believes that this indicates a sharp increase in revenue in 2024.

*Full commercialization in 2024*

# JonDeTech Sensors – About the company

## Company Brief

JonDeTech is a sensor technology company registered in its current form in 2013. The company develops products based on nanotechnology with the goal of improving energy efficiency. IR sensors can detect presence/absence, read temperature contactless and measure heat flow. JonDeTech was listed on First North Stock Market in May 2018. Leif Borg was appointed new CEO in December 2023. JonDeTech employed 12 people at the end of the third quarter, including four consultants.

*Nanotechnology based sensor technology company*

## Fabless Model

JonDeTech has three production partners that produce JIRS10, JIRS30 and JIRS40 in a fabless model. Thus, the whole company is permeated by the model where all products are handled in a similar way. Thus, JonDeTech is not required to make significant investments and bear the costs of building, operating, and upgrading production facilities. As production is outsourced, the need for employees is significantly lower than it would be when operating its own production facilities.

*Fabless model permeates JonDeTech*

## JONDETECH - OVERVIEW PRODUCTS

Product	Use	Benefits
<b>JIRS30</b>  Main product	<ul style="list-style-type: none"> <li>Heat flow measurement</li> <li>Contactless temperature measurement</li> <li>Presence detection</li> </ul>	<ul style="list-style-type: none"> <li>Can be integrated into more products than traditional sensors given the small size</li> <li>Can be used for heat flow measurement unlike silicon sensors</li> <li>Robust and flexible</li> <li>Generates a small current when exposed to IR radiation</li> <li>Can be surface mounted on most circuit boards</li> <li>Self-developed concept with full ownership of intellectual property</li> <li>Does not consume any energy</li> </ul>
<b>JIRS10</b>  Supplementary product	<ul style="list-style-type: none"> <li>Contactless temperature measurement</li> <li>Presence detection</li> </ul>	<ul style="list-style-type: none"> <li>Collaboration with larger multi-product module houses in the consumer electronics segment</li> <li>Complements JIRS30</li> <li>Already available as a sensor element through European supplier</li> <li>Easily integrates into multiple applications</li> </ul>
<b>JIRS40</b>  Supplementary product	<ul style="list-style-type: none"> <li>Contactless temperature measurement</li> <li>Presence detection</li> </ul>	<ul style="list-style-type: none"> <li>Pre-packaged sensor, ready for integration</li> <li>Smart Lock Presence/Absence feature sold to Yoyon</li> <li>Monitoring of temperature changes in electronic products</li> </ul>

Source: JonDeTech Sensors, Mangold Insight

# JonDeTech Sensors – Products

## JIRS30

The JIRS30 is a self-developed sensor that can measure temperature, presence, and heat flow in different configurations. The sensors can be integrated into a variety of products including "wearables" such as smart watches, bracelets, wireless headphones, smart patches and thermal cameras in the mobile. The product has numerous applications, which means that the potential customer base is large. The sensor element is one of the thinnest in the world, which means that it can be integrated into more different products than traditional sensors. To commercialize JIRS30, JonDeTech needs to improve yield and reduce variability in production.

*Develops IR sensors with a variety of applications*

### Sensor without protective cover

JIRS30 generates a directly proportional voltage when infrared radiation is added. It records wavelengths between 250 nm - 22.5  $\mu\text{m}$  corresponding to visual light up to the mid-infrared range. The sensor is only 0.17 mm high and made mostly of plastic. This allows the sensor to be used without a protective cover which conventional sensors need. JonDeTech's sensor can thus be used in different ways than today's sensors and a "naked" sensor element can make solutions more cost- and surface-effective.

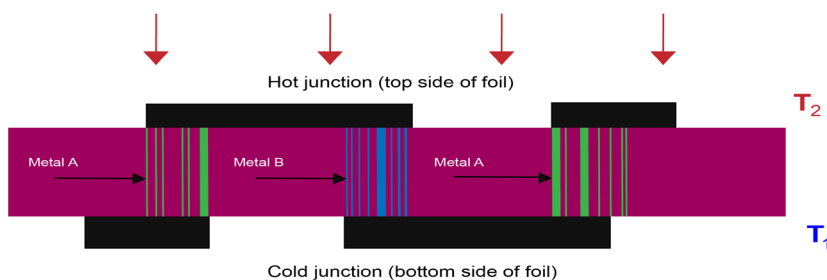
*Small sensor measuring only 0,17 mm high*

- Sensor can be surface mounted on most circuit boards
- Can be used for measuring heat radiation and heat flux
- The sensor is robust and flexible and can be manufactured in any form
- The sensor generates a small current when exposed to IR radiation

### Vertical design offers benefits

JonDeTech has developed a thermopile IR sensor based on nanotechnology. Nanotechnology has made a vertical configuration of the sensor possible, instead of a traditional horizontal construction. There are several advantages of a vertical structure where the hot and cold surface of the sensor are separated from each other. That is because they are on the front and back of the sensor, respectively. Thus, the entire hot surface can be used for detection. The configuration also allows the use of direct contact with the sensor, which has not previously been possible. It also allows for the measurement of heat flows thanks to the design which extends the uses.

*Vertical engineering helps with advantages over classic configuration*



Source: JonDeTech Sensors

# JonDeTech Sensors – Products cont.

## **JIRS10**

The silicon based sensor element, JIRS10, is manufactured according to a fabless model. The company has made some parts of the product design and launched the sensor element under its own brand. The product is sold and distributed via JonDeTech's channels. The JIRS10 is also packaged by the company's Taiwanese partners with an application-specific integrated circuit (ASIC) which we mention as the integrated product JIRS10. Engineering samples are available for the product which means that prototypes of a composite system can be evaluated and tested. It is owned and launched by JonDeTech's partners in Taiwan and there is a will from both parties that JonDeTech will become a reseller of the product. JIRS10 is commercially available as a sensor element. The company's goal is for the packaged solution to be commercially available in the second quarter of 2024.

*Packaged solution to be commercially available Q2 2024*

## **JIRS40**

The JIRS40 is based on silicon and is a pre-packaged sensor product. This product is commercially available. Thus, the JIRS40 is already integrated with electronic components that are needed for the end products to be fully functional for customers, for example in consumer electronics. JonDeTech has received two orders from Zhuhai Yaoyang Electronic Technology Co. (Yoyon) for 110 thousand units. Orders relate to smart locks. Delivery is due in the fourth quarter of 2023. These orders amount to approximately USD 110,100, which is approximately USD 1 per unit. JonDeTech established a subsidiary in Shanghai, China in November. The subsidiary will deliver the order to Yoyon and will facilitate further business in China.

*Available sensor product*

## **Uses**

There are significant uses for the company's products where the main areas are characterized by contactless temperature measurement, presence detection and heat flow measurement (HEATFLUX).

*Significant use cases*

### **Contactless temperature measurement**

Contactless temperature measurement can be used for temperature monitoring in products, production facilities and electrical installations. In addition, temperature can be measured contactless by mobile phone, in office buildings or homes. For example, contactless fever measurements can be used with your mobile phone. Ofilm has tested functionality and verified that the sensor element could be used in a mobile phone. The sensor is calibrated to accurately measure the temperature range 35 to 39 degrees with an accuracy of  $\pm 0,3$  degrees. It can also be used for measurement on a larger area by keeping the sensor at a longer distance.

*Can measure temperatures in products as well as with products*

### **Presence detection**

Presence detection via body heat can be used, for example, for awakening of electronic equipment, presence/absence detection for computers and detection for light control in e.g. toilets. The sensors measure the temperature difference to determine if someone is nearby. In this way, electronics can be turned on and off in close proximity to humans, saving a great deal of energy.

*Presence detection has several applications*

# JonDeTech Sensors – About the company cont.

## Heat flow measurement

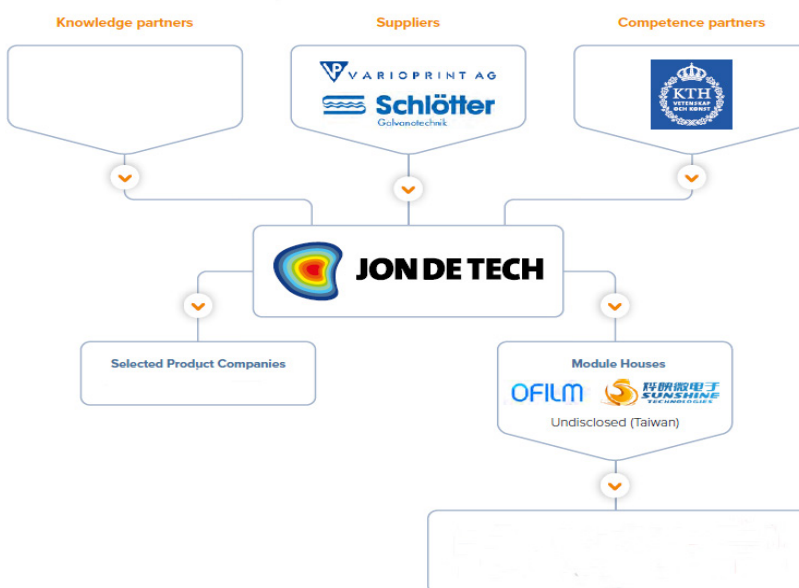
Heat flow measurement (HEATFLUX) has several potential uses. Among other things, for contact-based temperature measurement in various wearables. It can also be used as an overheat protection in various products such as batteries, consumer electronics and ball bearings. Uses also include smart clothing such as body heat flow in blue light personnel, divers, military personnel and athletes. In addition, it is also possible to read heat flow through windows for precise control of heat and AC but also for automatic solar shielding. Monitoring of heat flow in, for example, pipes or chimneys is also other possible uses. Thus, heat flow measurement is possible with JIRS30.

*Can be used as an overheat protection, in smart clothing as well as for controls of heat*

## Business Model

JonDeTech's sensors can be integrated into a variety of applications. The company has chosen to focus on two specific customer segments. These are partly module houses and partly product and industrial companies. Below is the ecosystem in which the company operates:

*Targets two specific customer segments*



Source: JonDeTech Sensors

## Module house (OEM/ODM)

Refining sensor solution for further sale to OEMs through so-called design-wins. This means that JonDeTech's sensor element is designed into a larger product design, which contributes to the continuous sales volume of the component. JonDeTech anticipates that the customer segment has potential to generate high demand for sensor elements in the future. The end customers of OEMs may be e.g. producers of electronic hardware such as Acer, Dell, Htc, Lenovo, Asus, Meizu and Oppo.

*Adds sensor solution for OEMs through design-wins*

# JonDeTech Sensors – About the company cont.

## Product and industrial enterprises

The company addresses product and industrial companies that have their own production and assembly of final products. JonDeTech's products can be part of a final product with this type of customer. Volumes are typically lower than those intended for module houses. The segment is important, however, as these customers can quickly build Proof of Concept or prototypes for various types of applications where JonDeTech's products add value. These customers can be addressed through both direct sales and potential partners. Most potential partner and distribution channels are to be evaluated, given a high level of interest shown by other segments. These include agents, distributors of electronic components and engineering consultancy companies that can lead to product development projects in various industries.

*Can provide concrete references for new products*

## Collaborations JonDeTech

JonDeTech has built a network of partners. Among other things, engineering consultancy firms have worked with the aim of quickly staffing customer projects when needed, as it can take too long to recruit staff as the project's resource needs increase. Through cooperation with KTH and others, it is ensured that new knowledge in production methods and nanotechnology will enter the company, so that processes and methods can be further developed and refined.

*Ensures integration of customer solutions*

## The partnership with Ofilm

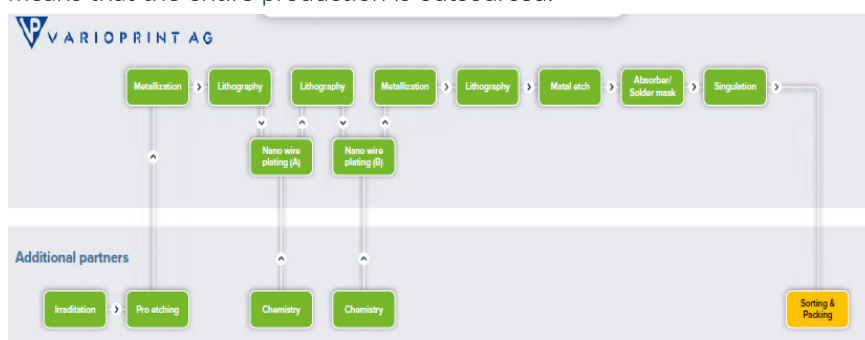
Ofilm is one of the world's largest companies in the field of electrical components and systems assembly. The collaboration has been going on for several years where Ofilm verified JIRS30 functionality in three areas: presence detection for digital locks, module for detection of presence/absence of laptops and contactless temperature measurement as an accessory to mobile phones. Ofilm is waiting for the JIRS30 to be available in larger volumes as a finished product before resuming commercial dialog.

*Cooperation with producers in Europe and the PRC*

## Varioprint as production partner

For the development and production of JIRS30, the company has a collaboration with Swiss PCB manufacturer Varioprint. The entire production flow is completed with the sub-process metallization carried out by Hofstetter PCB AG and the electroplating carried out by the chemical and electrolyte specialist Schlötter. This means that the entire fables model is set up, which means that the entire production is outsourced.

*Varioprint is responsible for the production of JIRS30*



Source: JonDeTech Sensors

# JonDeTech Sensors – About the company cont.

## Collaboration with Sunshine Technologies

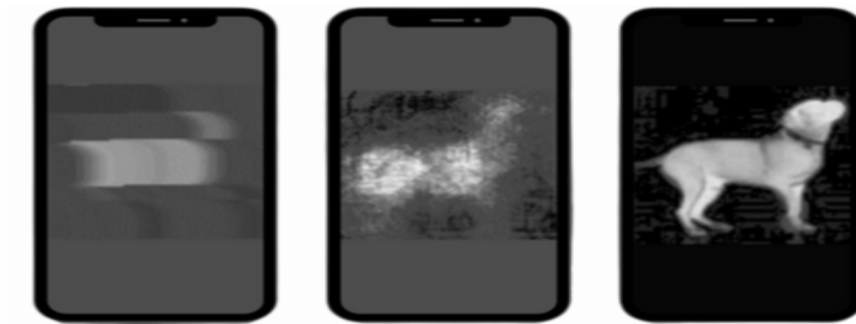
JonDeTech has strong relationships with Shanghai Sunshine Technologies, which in turn have strong relations with OEMs. A letter of intent was signed in 2022 regarding the development of a prototype for an application of JonDeTech's patented Thermal Painter.

*Letter of Intent regarding Thermal Painter*

## Thermal Painter

The software can be integrated into smartphones that allow it to take relatively high-resolution pictures with your phone. The mobile can thus be used as a thermal camera by means of a sensor only.

*Mobile can be used as thermal camera*



Source: JonDeTech Sensors

## Commercialization

- JIRS10 is a commercially available sensor element based on MEMS (micro-electromechanical system) technology.
- The JIRS10 is packaged by a partner in Taiwan who designed a custom-made ASIC, which assembles with the JIRS10 to create the packaged solution. The packaged solution came in Engineering Sample status this summer, which means that the product can now be produced in volume, but where it must be tested and verified before it is released commercially. This work is ongoing during the fourth quarter of 2023 and will continue into the first quarter of 2024. The goal is for the partner to begin sales during the second quarter of 2024. JonDeTech has a dialog with the partner company about being a reseller for this product in certain markets.
- The JIRS30 has reached Engineering Sample status and is believed to be commercially ready for delivery in the summer of 2024.
- The JIRS40 is a commercially available product and is available for order

*Close commercialization for JIRS30 and integrated product JIRS10*

## Evaluation of JonDeTech products

A global European product company evaluates JonDeTech's heat flow functionality for use in multiple products. Interest has also been shown by a European manufacturer of biometric solutions which evaluates the sensors for presence detection. Mangold welcomes companies' interest in JonDeTech's products.

*Interest in JonDeTech's products*

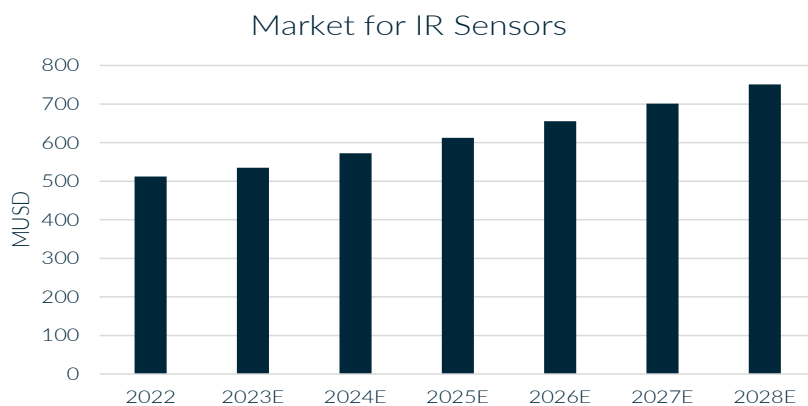


# JonDeTech Sensors – Market

## The market for IR sensors

The market for IR sensors is expected to grow from USD 535 million to USD 751 million from 2023 to 2028, according to market research firm Markets and Markets. This corresponds to an average annual growth rate (CAGR) of 7 percent. Of the uses, the detection of humans and motion is expected to represent the largest market share in 2023. One of the larger market segments expected to grow significantly in the coming years is contactless temperature measurement. JonDeTech is active in both areas which is expected to benefit the company.

*Expected to grow by 7 percent (CAGR) annually*

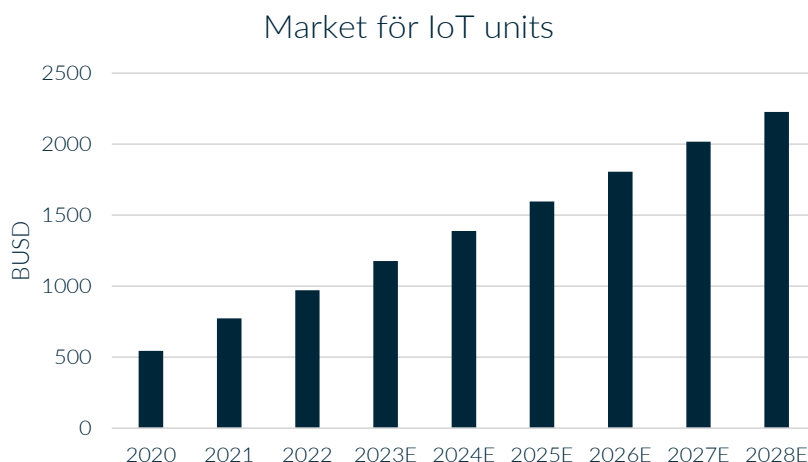


Source: Mangold Insight, MarketandMarkets

## IoT-market

The IoT market is expected to grow from BUSD 970 to BUSD 2,227 between 2022 and 2028, according to Statista statistics service. This corresponds to an average annual growth rate (CAGR) of 14,8 percent. At the same time, the number of IoT units is expected to increase from 13.1 billion to 29.4 billion between 2022 and 2030. Infrared sensors can increase the efficiency of wireless networking and increase the storage capacity of data within IoT networks. This is because activation of devices can be controlled via sensors. The increase in sensors and IoT units opens up for JonDeTech, which should be able to take market share through its unique sensor JIRS30.

*IR sensors can control IoT devices expected to reach 29.4 billion by 2030*



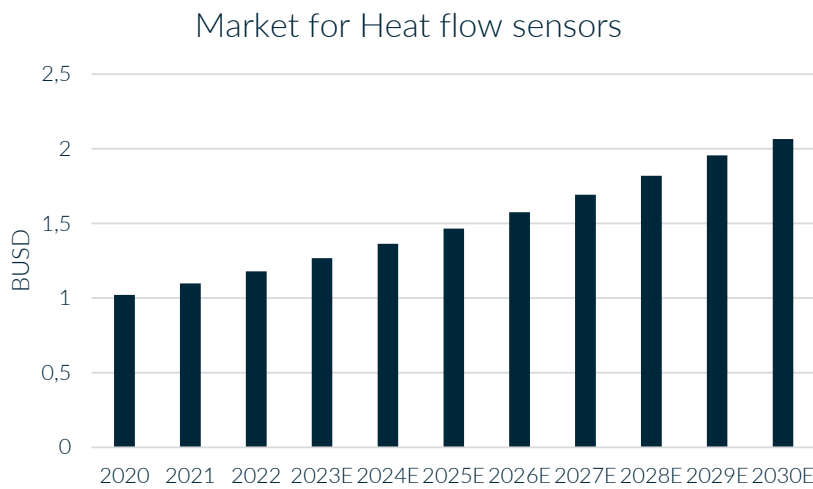
Source: Mangold Insight, Statista

# JonDeTech Sensors – Market cont.

## Heat flow sensors

In 2017, the market for heat flow sensors amounted to approximately BUSD 1 and is expected to reach approximately BUSD 2 by 2030 according to market research company Dataintel. Growth is expected to reach 7.5 percent annually (CAGR) from 2017 to 2030. Growth is driven by demand for measuring thermal performance in products, studies on physical phenomena related to heat transfer, use in wearables, and medical implants. It is also used in advanced ventilation, heating and air-conditioning systems.

*The market for heat flow sensors is expected to grow by 7.5 percent (CAGR) annually*

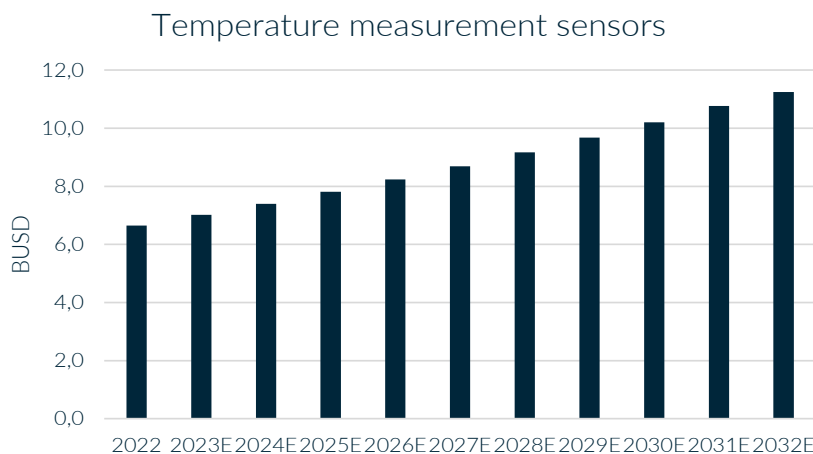


Source: Mangold Insight, Dataintel

## Temperature measurement sensors

According to Allied Market Research, the temperature sensor market is expected to grow from about BUSD 6.7 to BUSD 11.2 between 2022 and 2032. This corresponds to an average annual growth rate (CAGR) of 5.5 percent per year. The increase is driven by demand for temperature measurement in, among other things, watches, vehicles, computers, smartphones and medical equipment.

*The market for temperature measurement sensors is expected to grow by 5.5 percent annually*



Source: Mangold Insight, Allied Market Research

# JonDeTech Sensors – Competitors

## Competitive Comparison

Compared with its competitors, we clearly see that JonDeTech's JIRS30 has major advantages over its competitors. JonDeTech's sensor elements have all the uses that the competitors we compare with have which is a significant advantage compared to having to use several different sensors for the different functions. In addition, the JIRS30 is thinner, allowing it to be integrated into a wider range of products which also is a big advantage over larger sensors that can be used on fewer occasions. On the other hand, the product is not commercially launched compared to the competitors who have finished products. As we anticipate that JIRS30 will be commercialized in 2024, we see that these benefits will contribute to JonDeTech taking market share moving forward.

*The JIRS30 is thinner and more usable than the competition*

JONDETECH - COMPARISON COMPETITORS				
COMPANY	Product	Technology	Uses	Size (mm)
Texas instruments	TMP007	IR	Contactless temperature measurement	1,9 x 2,2 x 0,6
STMicroelectronics	STHS34PF80	IR	Presence detection	3,2 x 4,2 x 1,455
Asahi Kasei Microdevice (AKM)	AK9754AE	IR	Presence detection	2,2 x 2,2 x 0,6
GreenTeg	gSKIN	Heat Flux	Body temperature measurement	2,0 x 2,0 x 0,5
Hukseflux	HFPO1	Heat Flux	Heat flow measurement	100,0 x 100,0 x 5,4
JonDeTech	JIRS30	IR	Contactless temperature measurement, heat flow measurement, presence/absence detection, body temperature measurement	3,0 x 3 x 0,17

Source: Mangold Insight

## HeatFlux Competitors

Swiss **GreenTeg** offers heat flow sensors like JonDeTech's product with a size of 2 x 2 x 0.5 mm where the main difference is that JIRS30 is thinner. The company also offers tailor-made solutions to ODMs. The company's sensor has been integrated into solutions related to smart clothes, smart watches, smart patches and more. Mangold sees GreenTeg as JonDeTech's biggest competitor given the similarity of the products and their uses.

*JonDeTech's biggest competitor according to Mangold*

Dutch **Hukseflux** is a market leader in sensors for heat flow measurement. The company's best-selling sensor is a thermopile IR sensor similar to JonDeTech's JIRS30 sensor. It differs significantly, however, as the sensors have other applications such as geotechnology, meteorology and research. The focus is on high sensitivity in particular, where the sensor is wired, significantly larger, more expensive and with other applications. However, there is a risk that the company will develop a product like JonDeTech's given its expertise in sensor technology.

*Thermopile IR sensor similar to JonDeTech*

# JonDeTech Sensors – Competitors

## Competitors of JonDeTech Sensors in sensors

The Japanese **Asahi Kasei Microdevice (AKM)** has a variety of sensors including IR human presence detection sensor, adapted for battery-powered applications with limited space. Sensor size is only 2.2 x 2.2 x 0.6 mm. The sensor can be used in, among other things, IoT, lamps, household appliances, smart locks and more. In presence detection, the company is a competitor to JonDeTech where AKM's sensor is 0.43 mm while JonDeTech's is 0.17 mm. AKM can already mass produce its sensors while JonDeTech has not launched its sensor commercially.

*Presence detection competitor*

American **Texas Instruments (TI)** is a global semiconductor technology company with revenue of approximately USD 20 billion by 2022. In the company's sensor division, the company has over 200 different sensors. Of these, 160 are temperature sensors with application areas: industry, automotive industry and personal electronics. The company has a high production capacity with niche sensors that can match the specifications of JonDeTech's sensors with general application areas.

*Produces over 200 different sensors*

Franco-Italian **STMicroelectronics** is Europe's largest semiconductor company with sales of approximately USD 16 billion by 2022. The company provides the time-of-flight sensor VL53L0X which can measure distance by measuring the time for photons to be reflected. Uses include presence/absence functions for computers and IoT devices, auto focus, collision avoidance, background lighting control, automatic doors, and gesture reconnaissance.

*Europe's largest semiconductor company*

American **Amphenol** is a company active in the military, aviation and automotive industries, mobile devices, IT, network and broadband. The company designs and manufactures products within fiber optics, different types of cables and interconnected systems. Amphenol offers analog IR sensors for temperature measurement measuring 1.8 x 1.8 mm where the company is a competitor to JonDeTech.

*One of the world's largest manufacturers of interconnection products*

# JonDeTech Sensors – Peers

## Peers to JonDeTech Sensors

Mangold chooses to compare JonDeTech with Peers that we consider relevant in terms of market capitalization, geography and sector. The reason we do not choose to compare with the competitors mentioned in the previous pages is that they are larger, mature and multinational companies with many areas of activity. A comparison does not give us any further insight into what JonDeTech should be valued at. We include manufacturers of sensors, semiconductor companies with fabless production and component manufacturers operating in the Nordic countries.

*Relevant peers in terms of market capitalization, geography and sector*

### JONDETECH - PEERS

Company	Market cap		Sales		P/S		EV/S			P/E
	(MSEK)	Ltm (MSEK)	Ltm	23E	24E	Ltm	23E	24E		
Sivers Semiconductors	1460	248,7	5,9	6,3	5,3	6,0	6,4	5,4	nm	
Fingerprint Cards	1140	695,4	1,6	1,6	1,2	1,6	1,6	1,1	nm	
NEXT Biometrics Group	672	32,1	20,9	26,2	23,8	18,3	22,9	20,8	nm	
Acconeer	574	38,8	14,8	16,4	15,7	13,7	15,2	14,5	nm	
Neonode	319	54,6	5,8	5,5	5,1	2,4	2,2	2,1	nm	
<i>Median</i>	<i>672</i>	<i>54,6</i>	<i>5,9</i>	<i>6,3</i>	<i>5,3</i>	<i>6,0</i>	<i>6,4</i>	<i>5,4</i>	<i>nm</i>	
<i>Average</i>	<i>833</i>	<i>213,9</i>	<i>9,8</i>	<i>11,2</i>	<i>10,2</i>	<i>8,4</i>	<i>9,7</i>	<i>8,8</i>	<i>nm</i>	
<b>JonDeTech Sensors</b>	<b>20</b>	<b>0,6</b>	<b>32,9</b>	<b>11,6</b>	<b>0,7</b>	<b>42,5</b>	<b>15,0</b>	<b>0,9</b>	<b>nm</b>	

Source: Mangold Insight, börsdata, yahoo finance

## Multiple Valuation

None of the company's Peers is profitable, which means that the companies have a negative P/E multiple. Mangold expects JonDeTech's sales to increase which is expected to lead to an EV/S multiple of 0,9 in 2024 compared to with a average of 8,8. It is lower than the average for our chosen Peers. We also sees that the P/S ratio will amount to 0,7 which is lower than the average of 10,2 in 2024. In terms of market capitalization, Peers are significantly larger than JonDeTech, to a large extent because the companies are commercialized in contrast to the the minimal sales that JonDeTech has.

*None of the company's Peers are profitable*

# JonDeTech Sensors – Estimates

## Development of JonDeTech in 2023

JonDeTech's net sales increased during the first three quarters of the year by 239 percent to SEK 545 thousand, compared with the previous year. At the same time, employment cost has been reduced by 44 percent. JonDeTech's other costs increased to SEK 21.5 (19.7) million, which corresponds to an increase of 8 percent. One reason for the increase is costs of a one-off nature in the third quarter of approximately SEK 3.4 million. These concerned product development costs, bridge loan financing and the rights issue. Personnel costs have decreased significantly to SEK 8.1 (15.2) million, corresponding to 47 percent lower. That JonDeTech is reducing costs and generating sales is seen as a good sign that the company is on the right track.

*Reduced costs and higher net turnover*

JONDETECH - OUTCOME Q1-Q3		
(TSEK)	Q1-Q3 22	Q1-Q3 23
Sales	161	545
Growth (%)		239%
Activated work	7 777	4 328
Growth (%)		-44%
Other expenses	19 691	21 548
Change (%)		9%
Personnel costs	15 214	8 091
Change (%)		-47%
Depreciation	422	347
EBIT	-27 389	-25 113
Change (%)		8%
Profit	-30 972	-27 014
Change (%)		13%

Source: Mangold Insight

## Quarterly estimate

Mangold predicts that JonDeTech's sales will increase to approximately SEK 1.2 million in the fourth quarter of 2023. This is because we expect the order of JIRS40 to be booked during the quarter. Net sales are expected to increase by 609 percent in 2023 compared to the previous year. The continued sale and delivery of JIRS40 and the commercialization of the integrated product JIRS10 and JIRS30 are seen as crucial for the company's future sales.

*Sales are expected to increase by 609 percent in 2023*

JONDETECH - QUARTERLY ESTIMATE					
	Q1	Q2	Q3	Q4E	FY23E
Total Income (TSEK)	1 333	1 730	1 570	2 699	7 332
Sales (TSEK)	0	120	425	1 155	1 700
Growth (%)	-	-	254%	172%	609%

Source: Mangold Insight

# JonDeTech Sensors – Estimates

## Sales estimate

Mangold estimates that JonDeTech's sales will increase significantly in the coming years. JonDeTech has started selling JIRS40, in addition JIRS30 is expected and the integrated product JIRS10 will be launched commercially in the second quarter of 2024. Sales are expected to be driven mainly by an increased share of the self-produced sensor JIRS30, which is estimated to have a higher margin than the other products. Mangold also assumes that JonDeTech will be able to negotiate better conditions for the JIRS40 and the integrated product JIRS10, given a higher sales volume. The estimate is based on the company's success in the commercializing the JIRS30 and commencing sales of the integrated product JIRS10. There is a risk that further capital raising may be needed in the event of significant delays in commercialization or failure of warrants programs. We consider that JonDeTech is in an interesting position where the path to commercialization is clear, with production processes in place for mass production.

*Expected to increase sales significantly in the coming years*

### JONDETECH - SALES ESTIMATES

(MSEK)	2022	2023E	2024E	2025E	2026E	2027E
Sales	0,2	1,7	28,9	63,6	127,1	228,9
Growth (%)	3 809%	609%	1 600%	120%	100%	80%
Gross profit or loss	12,3	6,6	16,8	38,1	78,8	146,5
Gross margin (%)	100%	90%	58%	60%	62%	64%

Source: Mangold Insight

## Cost and margin estimates

Mangold estimates that costs will increase at a lower pace than sales growth, which is expected to lead to profitability in 2026. Increased personnel costs are estimated to come mainly from the employment of sales personnel. Other costs are expected to remain the main cost item in the future.

*Expected profitability in 2026*

### JONDETECH - COST ESTIMATES

(MSEK)	2022	2023E	2024E	2025E	2026E	2027E
Personnel costs	-19,5	-10,9	-14,2	-17,2	-22,4	-24,1
Other expenses	-23,6	-29,0	-36,3	-42,3	-46,5	-50,2
Depreciation	-0,6	5,6	5,6	5,5	5,4	5,2
EBIT	-31,4	-38,9	-39,3	-26,9	4,6	66,9
EBIT margin	-255%	-2 291%	-138%	-43%	4%	29%

Source: Mangold Insight

# JonDeTech Sensors – Financing

## Financing

JonDeTech completed a rights issue in November 2023. It was subscribed at 88.6 percent with proceeds of SEK 36.2 million before issue costs. The subscription price amounted to SEK 0.04 per share and the number of shares increased by approximately 904.4 million shares. 904.4 million warrants of series TO2 and TO3 were issued in connection with the issue. Mangold Fondkommission is the financial advisor in the transactions.

*Proceeds of SEK 36.2 million before issue costs*

The subscription period for TO2 runs from 12 January 2024 to 26 January 2024. The subscription rate is 70 percent of the volume weighted average rate between 27 December 2023 and 10 January 2024. The subscription price can amount to a maximum of SEK 0.05 per share and the company can receive a maximum of SEK 45.2 million before issue costs.

*May receive SEK 45.2 million before issue costs through TO2*

The subscription period for TO3 runs from 17 September 2024 to 30 September 2024. The subscription price can amount to a maximum of SEK 0.06 per share, which entails a maximum of SEK 54.3 million from warrants.

*Can generate SEK 54.3 million before issue costs through TO3*

JonDeTech will use the proceeds to complete high volume production process of its own sensor element JIRS30 for commercialization. This includes further development of the company's product portfolio and critical processes such as delivery and quality control. Capital will also be used to expand sales, repay bridge loans and debt through the financing agreement with NGO1.

*To be used for commercialization and extended sales work*

Mangold estimates that the company will have sufficient working capital to reach profitability given successful outcomes in TO2 and TO3.

*Estimated to be able to achieve profitability given successful warrant programs*

## Investments

Mangold estimates that JonDeTech will need to invest a total of SEK 21 million between 2023 and 2027. Investments are expected to be lower in 2024 and beyond, as announced by the company, with the focus on increased sales. Investments are expected to be made into the development of the product portfolio.

*Estimated to invest a total of SEK 21 million over the estimate period*



# JonDeTech Sensors – Valuation

## Low-valued share

Mangold uses a DCF model to value JonDeTech. A rate of return requirement of 12,2 percent is considered appropriate for JonDeTech Sensors. It corresponds to the recommended size-related premium of 3,8 percentage for companies with a market capitalization of around SEK 100 million and with a rate of return requirement of 8,4 percent according to the PwC risk premium study of 2023. The valuation results in a fair value of SEK 0.104 per share. Mangold sets the price target of SEK 0.10 per share. Mangold believes that JonDeTech can significantly increase sales given the commercialization of the JIRS30 and the integrated product JIRS10.

*Price target SEK 0.10 per share*

### JONDETECH - DCF

(TSEK)	2023E	2024E	2025E	2026E	2027E
EBIT	-38 947	-39 318	-26 882	4 568	66 886
Free cash flow	-34 108	-36 638	-31 619	8 642	56 972
Terminal value					558 545

Assumptions	Req. return	Growth	Tax
	12,2%	2%	21%

### Fair value

Enterprise value	302 524
Equity value	296 797

<b>Fair value per share (SEK)</b>	<b>0,104</b>
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Source: Mangold Insight

## Sensitivity analysis

Mangold has conducted a sensitivity analysis to test the model's outcome given different sales levels and return requirements. If JonDeTech's sales become 90 percent of the estimated sales, the fair value will fall to SEK 0.057 per share. Similar outcomes are noticeable with a 10 percent increase in sales, the fair value increases to SEK 0.161 per share. In summary, the model shows a range between SEK 0.047 and SEK 0.187 per share. Variation in sales has the greatest impact on fair value. The model displays upside in all tested cases.

*Valuation range between SEK 0.047 and SEK 0.187 per share*

### JONDETECH - SENSITIVITY ANALYSIS

Req. return %	0,9x	Base Sales (x)	1,1x
11,2	0,070	0,122	0,187
<b>12,2</b>	0,057	<b>0,104</b>	0,161
13,2	0,047	0,089	0,140

Source: Mangold Insight

# JonDeTech Sensors – SWOT

## Strengths

- One of the world's thinnest sensors
- Fabless model allows great scalability without major investment in factories
  - Strong partners

## Weaknesses

- Long development phase
  - Not profitable

SWOT

## Opportunities

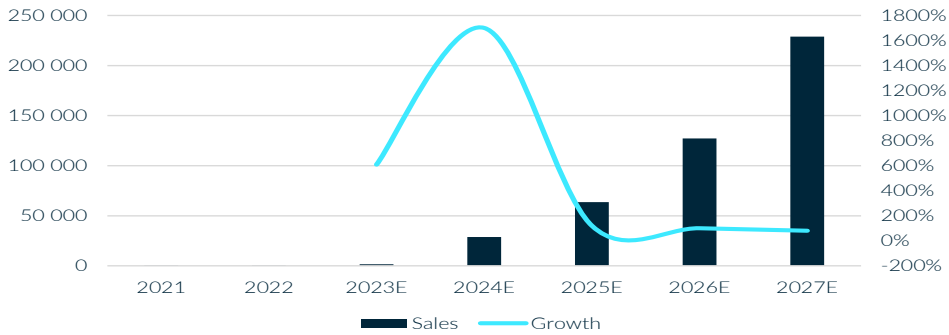
- High growth in markets with many use cases
- Contract with large manufacturer

## Threats

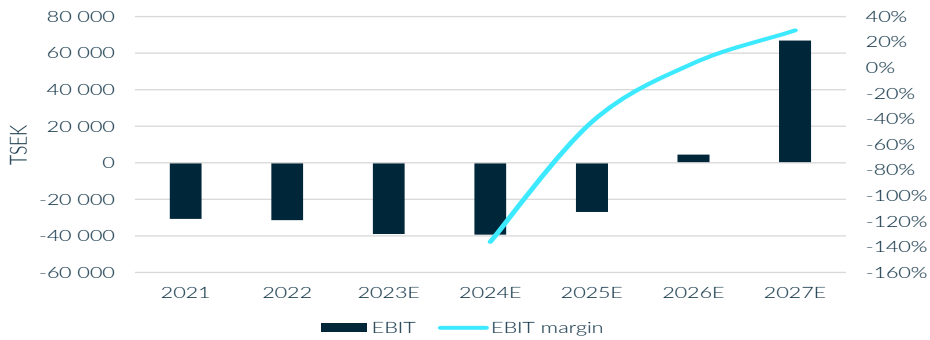
- Competitive sector
- Competitive technology turns out superior
  - Commercial delay

# JonDeTech Sensors – Appendix

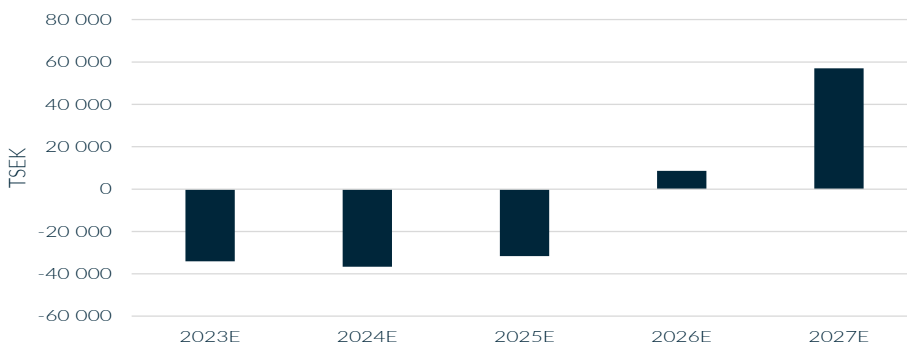
JonDeTech - Sales & Growth



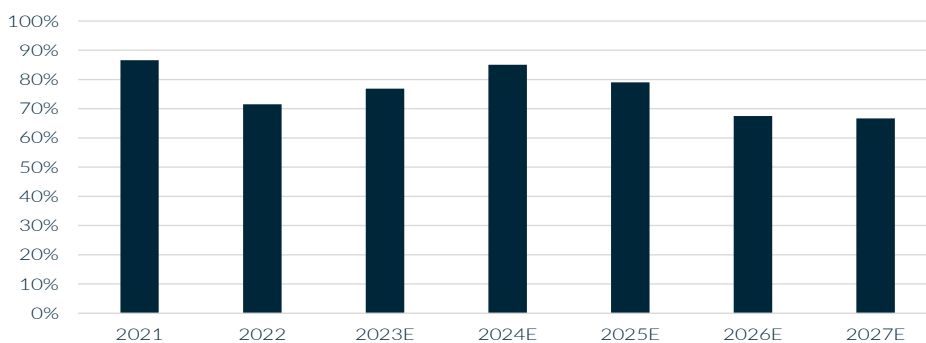
JonDeTech - EBIT & margin



JonDeTech - Free Cash Flow



JonDeTech - Solvency



# JonDeTech Sensors – Appendix

## **Different types of IR technologies**

There are generally three different types of IR technology used, these are bolometers, thermopiles and pyroelectric sensors.

*Generally three different IR technologies*

## **Bolometers**

Bolometers are instruments that measure heat radiation through an object that acts through a temperature-dependent electrical resistance.

*Operates through a temperature-dependent electrical resistance*

## **Thermopiles**

Thermopiles are the technology that JonDeTech uses as IR technology. It consists of series-connected thermocouples that generate electrical voltage in response to temperature differences. The principle of IR reading derives from the Seebeck effect. It states that when two different metals are exposed to a temperature difference, an electric voltage is generated.

*Series-connected thermocouple generates voltage in response to temp differences*

## **Pyroelectric sensors**

Pyroelectric sensors are an instrument that detects infrared radiation due to differences in how different materials generate electric charge in response to temperature changes. This is known as the pyroelectric effect.

*Works through the pyroelectric effect*

## **Alternative sensor technologies for presence detection**

Alternative sensor technologies include radar, optical and ultrasonic. Radar emits electromagnetic energy towards an object where the echo is then observed. An optical sensor detects light and the absence of light. Ultrasonic sensors sense the vibration of sound waves reflected to detect distance and presence.

*Alternative sensor technologies include radar, optical and ultrasonic*

# JonDeTech Sensors – Appendix

## Board

**Jan Johannesson** is Chairman of the Board of JonDeTech. He is educated as a civil engineer at Lund University and has been a board member since 2021. He is also chairman of NordAmps AB and NYN Consulting AB, and board member of Fidesmo AB, Audiodo AB and Kyrkbackens Hamn AB. He has previously been Senior Vice President at Fingerprint Cards, Head of Strategic Planning at ST-Ericsson and held several executive positions at Ericsson.

**Bengt Lindblad** is a board member of the company since 2015. He is a civil engineer in industrial economics from Linköping University. He is the CEO of Alfakraft Fonder, Fastighetsräntefonden, GlobeCap 100 and SHE Invest. He is also a board member of Jebel Investment, Linden Leaf and Malte Månson.

**Magnus Eneström** is a board member since 2019. He is an engineer from KTH. He is also active in Topick, MAQ, Erwator, Neque, Göronska skog, Broene, Mantaray hydrofoils and Stiftelsen Albert och Annas minne.

**Dave Wu** is a board member since 2020. He has an MBA from UC Berkeley. He is also Managing Director of Jiuyou Capital International PTE and Chairman of Unicorn Capital Group and Asia Perspective.

**Karl Lundahl** is a board member since 2022. He has a degree in chemical engineering from Chalmers. He is Vice President Product Management and Industrialization at Smoltek Semi. He has previously worked at Chalmers Industriteknik and Fingerprint Cards.

## Management

**Leif Borg** is CEO since December 2023. He was previously COO and has been active in the company since 2018. He is educated as an engineer and in Lean production at JMac in Japan. He has previously been CEO of Borg management, Head of Printworks at Crane Currency and production manager at AstraZeneca in Södertälje.

# JonDeTech Sensors – Income Statement & Balance Sheet

Income Statement (TSEK)	2021	2022	2023E	2024E	2025E	2026E	2027E
Revenue	6	240	1 700	28 896	63 572	127 144	228 859
Activated work	9 978	12 077	5 632	0	0	0	0
Cost of sales	0	0	-748	-12 136	-25 429	-48 315	-82 389
<b>Gross profit</b>	<b>9 984</b>	<b>12 317</b>	<b>6 584</b>	<b>16 760</b>	<b>38 143</b>	<b>78 829</b>	<b>146 470</b>
Gross margin	100%	100%	90%	58%	60%	62%	64%
Personnel costs	-16 100	-19 527	-10 935	-14 215	-17 201	-22 361	-24 150
Other expenses	-22 044	-23 590	-29 016	-36 270	-42 291	-46 520	-50 242
Depreciation	-2 433	-565	5 580	5 592	5 533	5 380	5 192
<b>EBIT</b>	<b>-30 593</b>	<b>-31 365</b>	<b>-38 947</b>	<b>-39 318</b>	<b>-26 882</b>	<b>4 568</b>	<b>66 886</b>
EBIT margin	-306%	-255%	-2291%	-136%	-42%	4%	29%
Net interest	-188	-5 485	-2 400	0	0	0	0
<b>Profit after net financial items</b>	<b>-30 781</b>	<b>-36 850</b>	<b>-41 347</b>	<b>-39 318</b>	<b>-26 882</b>	<b>4 568</b>	<b>66 886</b>
Taxes	1	-1	0	0	0	941	13 779
<b>Net profit</b>	<b>-30 783</b>	<b>-36 849</b>	<b>-41 347</b>	<b>-39 318</b>	<b>-26 882</b>	<b>3 627</b>	<b>53 108</b>

Source: Mangold Insight

Balance Sheet (TSEK)	2021	2022	2023E	2024E	2025E	2026E	2027E
<b>Assets</b>							
Cash and bank	10 367	4 773	8 047	61 848	30 229	38 871	95 843
Trade receivables	5 528	3 231	6 985	7 125	15 675	31 351	57 685
Inventory	0	0	0	0	0	0	0
Fixed assets	45 383	55 804	55 924	55 332	53 798	51 919	49 727
<b>Total assets</b>	<b>61 278</b>	<b>63 808</b>	<b>70 957</b>	<b>124 305</b>	<b>99 703</b>	<b>122 141</b>	<b>203 255</b>
<b>Liabilities</b>							
Account payables	8 217	7 679	16 392	18 620	20 900	39 711	67 717
Liabilities	0	10 500	0	0	0	0	0
<b>Total Liabilities</b>	<b>8 217</b>	<b>18 179</b>	<b>16 392</b>	<b>18 620</b>	<b>20 900</b>	<b>39 711</b>	<b>67 717</b>
<b>Equity</b>							
Restricted equity	1 154	3 436	53 719	144 157	144 157	144 157	144 157
Unrestricted equity	51 907	42 193	846	-38 472	-65 354	-61 727	-8 619
<b>Total equity</b>	<b>53 061</b>	<b>45 630</b>	<b>54 565</b>	<b>105 685</b>	<b>78 803</b>	<b>82 430</b>	<b>135 538</b>
<b>Liabilities and equity</b>	<b>61 278</b>	<b>63 808</b>	<b>70 957</b>	<b>124 305</b>	<b>99 703</b>	<b>122 141</b>	<b>203 255</b>

Source: Mangold Insight

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Mangold's analysts don't own shares in JonDeTech Sensors.

Mangold owns shares in JonDeTech Sensors such as own inventory.

Mangold owns shares in JonDeTech Sensors through an assignment as a liquidity provider.

Mangold has performed services for the Company and has received compensation from the Company based on this.

Mangold is under the supervision of the Swedish Financial Supervisory Authority.

Recommendation structure:

Mangold Insight grades stock recommendations over a 12-month term using the following structure:

Buy - An upside in the share of at least 20 percent

Increase - An upside in the stock of 10-20 percent

Neutral - An upside and downside in the stock of 0 to 10 percent

Decrease - A downside of the stock of 10-20 percent

Sell - A minimum of 20 percent downside of the stock