

To the international press

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Professional service robots are establishing themselves

By the end of 2008, about 63,000 service robots for professional use were sold. These high-tech and highly valuable robots are increasingly entering factories, hospitals, public buildings, dangerous and hazardous environments, oceans, the space, cow barns, fields, etc., reports the IFR Statistical Department in the new study "World Robotics 2009 – Service Robots", which was published on Wednesday in Frankfurt.

Compared with the operational stock of industrial robots which is more than one million, a rather low number of service robot units is on the market. But the potential is tremendous.

The total value of professional service robots sold by the end of 2008 was about US \$11 billion.

With 20,000 units, the service robots in defence, rescue and security applications, accounted for more than 30% of the total number of service robots for professional use sold at the end of 2008. Thereafter, followed field robots (mainly milking robots) with 23%, cleaning robots with 9%, medical robots and underwater systems with 8%, each. Construction and demolition robots (7%), mobile robot platforms for general use (6%) and logistic systems (5%) came in the next ranges. Only a few unit installations were used for inspection systems and public relations robots in 2008 compared with the previous year.

According to the projections for the period 2009-2012, the stock of service robots for professional use is forecasted to increase to some 49,000 units. Application areas with strong growth are defence, rescue and security applications, field robots, logistic systems, inspection robots, medical robots and mobile robot platforms for multiple use. The total value of these robots is estimated at about US\$ 10 billion.

The tendency to minimize the number of people in military operations, and the wish to reduce the risks for soldiers, have been strong factors in the increased interest in various types of defence, rescue and security applications. Security will be increasingly based on unmanned systems over the next 10 to 15 years. But these robots are also used for civilian applications. Currently the Unmanned Aerial Vehicles (UAVs) are primarily used in imaging missions, where they allow coverage of significant areas either for strategic missions or for generating an inventory of agricultural areas or forestry. Surveillance robots are used to assist human guards covering a large territory or to keep vigil in potentially dangerous areas. They could be used in a military area and also in chemical plants, nuclear storage facilities, etc.

From the category **field robots**, **cow-milking robots** were among the first robotic systems to be used in agriculture. The robotics system consists of a stationary unit into which the cow walks voluntarily to be milked. A transponder around the cow's neck informs the robot about its details, i.e. when it was last milked, how many litres, etc. During the milking process, milk flow and quality are monitored online. The farmer thus has more precise information about his herd. Numerous milking robot products have emerged in the recent years with resounding success. The advantages for farmers are obvious: less manual work and no more early-morning milking in the middle of winter. The benefits for the cows are just as significant: being able to choose when they want to be milked. The systems allow "free-flow cow traffic". Experience has shown that, left to themselves, cows will enter the unit to be milked two to four times a day, at almost any time of day or night.

Logistic systems describe the management of the flow of goods, their handling and packaging. All systems require mobility either in indoor or outdoor environments. Automated Guided Vehicles (AGV) are mobile robots used in industrial and in non-manufacturing applications to automatically move materials from point to point.

Applications of autonomous logistic systems comprise transportation, handling, packaging, sorting and delivery. Typically, these robots are installed in:

- Offices, hospital buildings or other public buildings to transport and deliver various goods
- Industrial environments for moving work-pieces, boxes, pallets or tools between machinery, transfer points or storages.
- In outdoor areas, particularly harbours, airports, or transshipment centres for the handling of goods of any kind.

Today **medical robotics** is considered one of the success-stories of service robotics. Generally, medical robotics has great potential to revolutionize clinical practice by:

- Facilitating medical processes by precisely guiding instruments, diagnostic equipment and tools for diagnosis and therapy
- Improving safety and overall quality of the medical surgery
- Enhancing the cost-effectiveness of patient care
- Improving the training and education of medical personnel through the use of

- simulators
- Promoting the use of information in diagnosis and therapy.

Most of the robots are used for surgery, especially in combination with minimal access surgery.

Service robots for personal and domestic use are recorded separately, as their unit value generally is only a fraction of that of many types of service robots for professional use. They are also produced for a mass market with completely different pricing and marketing channels. So far, service robots for personal and domestic use are mainly in the areas of **domestic (household) robots**, which include vacuum cleaning and lawn-mowing robots, and **entertainment and leisure robots**, including toy robots, hobby systems, education and training robots. Millions of these low-cost products were already sold and almost 12 millions are forecasted to be sold between 2009 and 2012 representing an estimated value of US\$ 3 billion.

World Robotics 2009 Industrial Robots and Service Robots can be ordered at www.worldrobotics.org

The IFR Statistical Department, which is hosted by the VDMA Robotics + Automation association publishes the study World Robotics every year. In 2009, for the first time, we will have two studies:

1. World Robotics 2009 Industrial Robots:

This unique publication presents comprehensive global statistics on industrial robots in uniform tables allowing consistent country comparisons. It contains detailed statistical data for some 40 countries, broken down by application areas, industrial branches, types of robots and by other technical and economic variables. Data on production, exports and imports are presented for a selection of countries. Trends in robot densities, i.e. number of robots per 10,000 persons employed in relevant sectors, are also featured.

2. World Robotics 2009 Service Robots:

This unique publication presents comprehensive global statistics on service robots, market analysis, case studies and international research strategies of service robots. The study is evaluated in cooperation with our partner the Fraunhofer IPA, Stuttgart, Germany.