

## CONTENTS

<b>CONTENTS .....</b>	<b>I</b>
<b>EDITORIAL:</b>	
<b>Preserve, Protect, Prosper- Achieve Packaging Sustainability with flexible Automation.....</b>	<b>V</b>
<b>EXECUTIVE SUMMARY .....</b>	<b>IX</b>
<b>I INTRODUCTION.....</b>	<b>1</b>
I.1 Sources and methods .....	1
I.1.1 Coverage .....	1
I.1.2 Data sources and reliability of data .....	1
I.1.3 Two types of stock data .....	2
I.1.4 Interpretation of the concepts of shipments, sales and yearly supply .....	3
I.1.5 Revision of time-series data on the robot stock .....	4
I.1.6 Data coverage and where to access data for previous years .....	4
I.2 Multipurpose manipulating industrial robots - definition and classification .....	6
I.2.1 Definition (ISO 8373) and delimitation.....	6
I.2.2 Classification by industrial branches.....	12
I.2.3 Classification by application areas.....	13
I.2.4 Classification by types of robots .....	14
I.3 Service robots: definition and classification .....	15
I.3.1 Provisional definition .....	15
I.3.2 Classification of service robots by application areas .....	15
<b>II WORLDWIDE DISTRIBUTION OF INDUSTRIAL ROBOTS .....</b>	<b>19</b>
II.1 Unit sales.....	19
II.2 Estimate of the worldwide operational stock of industrial robots .....	23
II.3 Estimate of the value of the world robot market in 2003 - 2008.....	27
II.4 Analysis of the effects of the business cycle on investments in industrial robots .....	32
II.5 Analysis of the development of robot density in selected countries .....	33
II.5.1 Definition of robot density .....	33
II.5.2 Measurements of robot density based on the total number of persons employed in the Manufacturing Industry .....	34
II.5.3 Measurements of robot density based on the total number of persons employed in the automotive industry and in all other branches.....	36
II.5.4 Estimate of robot density in all relevant markets .....	38
II.6 Analysis of the supply and stock of multipurpose industrial robots in 2003-2008 by major application areas .....	40
II.7 Analysis of the supply and stock of multipurpose industrial robots in 2003- 2008 by major industrial branches .....	48
II.8 Comparison between the motor vehicle industry and all other industrial branches.....	56
II.9 Supplies of multipurpose industrial robots in 2008 by Types of robots.....	65

<b>III</b>	<b>THE STRUCTURE OF THE DISTRIBUTION OF INDUSTRIAL ROBOTS IN INDIVIDUAL COUNTRIES .....</b>	<b>71</b>
	Introduction .....	71
	Americas:.....	72
	Brazil and Argentina .....	79
	North America .....	86
	All other American countries .....	97
	Asia / Australia:.....	98
	China .....	106
	India.....	111
	Indonesia.....	115
	Japan.....	118
	Republic of Korea.....	131
	Malaysia .....	141
	Singapore.....	144
	Taiwan, Province of China .....	146
	Thailand.....	151
	All other Asian countries.....	154
	Australia and New Zealand .....	155
	Europe: .....	159
	Austria .....	167
	Belgium/Luxembourg and Netherlands.....	175
	Czech Republic and Slovakia.....	185
	Denmark.....	194
	Finland.....	204
	France .....	213
	Germany.....	223
	Hungary.....	236
	Italy .....	241
	Norway .....	251
	Poland .....	260
	Portugal .....	266
	Russian Federation .....	271
	Slovenia.....	274
	Spain .....	279
	Sweden.....	289
	Switzerland.....	298
	Turkey.....	304
	United Kingdom.....	309
	All other European Countries .....	319
	Africa: .....	320
	South Africa .....	320
<b>IV</b>	<b>FORECAST OF WORLDWIDE INVESTMENT IN INDUSTRIAL ROBOTS IN THE PERIOD 2009-2012 .....</b>	<b>325</b>
	IV.1 International Business Outlook	
	IV.1.1 Situation.....	325
	IV.1.2 Outlook.....	325
	IV.2 Incentives to automate .....	326
	IV.3 Technical robotics trends and customer trends .....	328
	IV.4 Future development in the main markets.....	330
	IV.5 Conclusion and forecast 2009 – 2012.....	333

<b>V</b>	<b>THE PROFITABILITY OF INDUSTRIAL ROBOTS: ANALYSIS OF CASE STUDIES</b> .....	339
<b>V.1</b>	<b>Introduction and conclusions</b>	339
	V.1.1 Introduction	339
	V.1.2 Benefits of robot automation	339
	V.1.3 Conclusions	340
	Table V.1-1e Analysis of case studies – summary of profitability of robot investment	351
<b>V.2</b>	<b>Case study 1: Robot brings flexibility to laser welding</b> By: Katrin Stuber, KUKA Roboter GmbH, Germany	352
<b>V.3</b>	<b>Case study 2: Mirror, mirror...</b> By: Stefanie Senft, KUKA Roboter GmbH, Germany	354
<b>V.4</b>	<b>Case study 3: Reconstruction and full automation of the two 112 m long top coat painting lines at VW saxony</b> By: Harald Voigtländer, Dürr Systems GmbH, Germany	357
<b>V.5</b>	<b>Case study 4: Direct to the plaiting process</b> By: Walter Klaus, WITTMANN Robot Systeme, Germany	359
<b>V.6</b>	<b>Case study 5: Efficient pump motor saves 4500 manual lifts per day</b> By: Kajsa Pettersson, MOTOMAN robotec, Germany	362
<b>V.7</b>	<b>Case study 6: Robotic welding with 1,5 years payback time</b> By: Kajsa Pettersson, MOTOMAN robotec, Germany	364
<b>V.8</b>	<b>Case study 7: Robots reduce production costs for solar panel</b> By: Annelies Vander Hulst, FANUC Robotics, Benelux	366
<b>VI</b>	<b>SPECIAL FEATURES:</b>	
<b>VI.1</b>	<b>Robotics Visions to 2020 and Beyond – The Strategic Research Agenda for Robotics in Europe</b> By: Anne Wendel, EUnited Robotics, Belgium	368
<b>VI.2</b>	<b>Estimation of the future user potential of innovative robot technologies in SMEs – promising aspects</b> By: Dr. Steffen Kinkel and Ute Weißfloch, Fraunhofer-Institut für System- und Innovationsforschung ISI, Germany	376

<b>Annex A</b>	Time series of yearly shipments, operational stock and accumulated sales of multipurpose industrial robots .....	382
Table A-1	Estimated yearly shipments of multipurpose industrial robots in selected countries. Number of units.....	382
Table A-2	Estimated yearly shipments of multipurpose industrial robots in selected countries. Annual percentage change .....	384
Table A-3	Estimated operational stock of multipurpose industrial robots in selected countries. Number of units.....	386
Table A-4	Estimated operational stock of multipurpose industrial robots in selected countries. Annual percentage change .....	388
Table A-5	Total accumulated yearly sales of multipurpose industrial robots in selected countries. Number of units.....	390
Table A-6	Total accumulated yearly sales of multipurpose industrial robots in selected countries. Annual percentage change .....	39