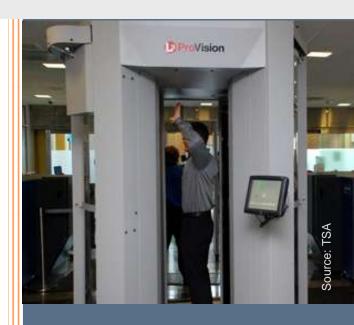
2012-2016

People Screening Technologies & Global Markets



Homeland Security Research Corp.

Table of Contents

1	Executive	e Summary	22
	1.1 Ma	ıjor Findings	22
	1.2 Ma	ijor Conclusions	24
	1.3 Pe	ople Screening Market - 2012–2016	27
	1.3.1	Systems Sales – 2012-2016	
	1.3.2	Maintenance, Upgrade & Refurbishment Market –2012–2016	29
	1.3.3	Systems Sales vs. Maintenance, Upgrade & Refurbishment	
		Market –2012–2016	30
	1.3.4	Consolidated People Screening Market - 2012–2016	
	1.3.5	People Screening Market by End User - 2012-1016	
	1.4 Pe	ople Screening Technologies	33
2	Introduct	tion	35
	2.1 Sc	ope	35
	2.2 Me	ethodology	37
3	Market D	rivers	39
		hibitors	
4			
5	SWOT A	nalysis	42
6		tive Analysis	
7	Business	S Challenges & Opportunities	45
8	Present F	People Screening Technologies & Products	48
	8.1 Ex	plosives Trace Detectors (ETD)	48
	8.1.1	ETD Principles of Operation	
	8.1.2	ETD Core Technologies	
	8.1.3	Ion Mobility Spectroscopy (IMS)	
	8.1.4	ChemiLuminescence (CL)	
	8.1.5	Electron Capture Detectors (ECD)	
	8.1.6	Surface Acoustic Wave (SAW)	
	8.1.7	ETD People Screening Portals	
	8.1.8	Hand-Held & Desktop ETD Devices	
		nole Body Scanners (AIT)	
	8.2.1	X-ray Backscatter Portals	
	8.2.2	Active MMWave Whole Body Scanners	
	8.2.3	Passive MMWave Whole Body Scanners	
	8.2.4	Terahertz Whole Body Scanners	81
	8.2.5	Comparison of MMWave/Terahertz vs. Backscatter X-ray Portals	QΛ
	8.2.6	Vendors and Products	
		etal Detection Portals & Devices	
	8.3.1	Hand-Held Metal Detectors	
	8.3.2	Walk Through Metal Detection Portals	
	0.5.2	wait iniough wetai Detection i Ortais	00

	8.4 Sh	oe Scanners	
	8.4.1	Threats and Government Policy	98
	8.4.2	Shoe Scanners: Vendors, Products & Prices	99
	8.5 Bo	ttled Liquids Scanners (BLS)	100
	8.5.1	Liquid Explosives Threats	100
	8.5.2	Liquid Explosives Screening	100
	8.5.3	DHS's SENSIT Program	101
	8.5.4	Liquid Detection: Techno-Tactical Considerations	101
	8.5.5	Liquid Explosives Scanners – Vendors, Products and Prices	102
	8.5.6	Liquid Explosives Scanners - Sample System	102
	8.6 Bo	dy Cavities Screening Systems	103
	8.7 Co	mputer Aided Detection (CAD) Software	105
	8.8 Bio	pmetric People Screening	106
	8.8.1	Biometric Identification, Drivers & Inhibitors and Government	106
	8.8.2	InfluenceBiometric Market Drivers & Inhibitors	
	8.8.3	Biometric Portals	
	8.8.4	Fused Biometric, Document Authentication and Interrogation	107
	0.0.4	Portals	100
	8.9 Mu	ılti-Modal & Multi-Threat Portals	
	8.9.1	Overview	
	8.9.2	Technology Status	
	8.9.3	Core Technologies	
	8.9.4	Example: Detection Systems Fusion Protocol (DSFP)	
		t-down Body Searcht-down Body Search	
	8.10 Fa	nd-Held Weapons and CBRNE Detectors	112
		st and Artificial Limbs Screening Technologies	
		Evolving Hand-Held MMWave Wand – Sample	
9	People S	creening Technologies Outlook - 2012-2016	116
		D Technology Outlook - 2012–2016	
	9.1.1		
	9.1.2		
	9.1.3	ETD of the Future: Performance & Operational Goals	
	9.1.4	Advanced Sample Collection	
	9.1.5	Dual Technology ETD	
	9.1.6	Pipeline ETD Technologies	
	9.1.7	Next Generation ETD Technologies	120
	9.1.8	Integrated Explosives, Chemical Warfare and Narcotics Trace Detectors	121
	9.2 Mu	ılti-Modal & Multi-Threat Portals	121
	9.2.1	Market Needs	
	9.2.1	Proposed High Throughput Multi-Threat People Screening	141
	J.Z.Z	Portal	123
	9.2.3	Future People Screening Portals - Technology Essentials	
	9.2.4	Future Multi-Threat Detection	
	9.2.5	Molecularly Imprinted Polymer (MIP) Sensors	
	0.2.0	molocalary imprinted i crymer (wiii) dericore	121

	9.2.6 9.2.7		
10	_	CAO "Checkpoint of the Future"	
10		A Checkpoint of the future: main concepts	
		in features of IATA Checkpoint of the future	
		A Checkpoint of the Future Outlook	
		·	
12		creening Markets -2012-2016	
		erview	
	12.1.1	Systems Sales – 2012-2016	135
		Maintenance, Upgrade & Refurbishment Market –2012–2016	138
	12.1.3	Systems Sales vs. Maintenance, Upgrade & Refurbishment	4.40
	1011	Market –2012–2016	140 440
	12.1.4	Consolidated People Screening Market - 2012–2016 D Portals & Devices Market – 2012–2016	142 111
		Global Market by Customer Sector - 2012–2016	
		Systems Sales by Region & Sector - 2012–2016	
	12.2.2		
		Eight Key National Markets - 2012–2016	
		nole Body (AIT) Scanners Market – 2012–2016	
		Global Market by Customer Sector - 2012–2016	
		Systems Sales by Region & Sector - 2012–2016	
		Market by Region - 2012–2016	
	12.3.4	Eight Key National Markets - 2012–2016	172
	12.4 Me	tal Detection Portals & Devices Market – 2012–2016	173
	12.4.1	Global Market by Customer Sector - 2012–2016	173
		Systems Sales by Regions & Sectors - 2012–2016	
	12.4.3	Market by Region - 2012–2016	182
	12.4.4	Eight Key National Markets - 2012–2016	187
		oe Scanners Market – 2012–2016	
		Global Market by Segment - 2012–2016	
		Market by Region - 2012–2016	
		Eight Key National Markets - 2012–2016	
		uid Explosives Scanners Market – 2012–2016	
		Global Market by Segment - 2012–2016	
	12.6.2	Market by Region - 2012–2016	196
		Eight Key National Markets - 2012–2016	
		Iti-Modal & Multi-Threat Portals Market – 2012–2016	
	12.7.1		
		Systems Sales by Region & Sector - 2012–2016	
		Market by Region - 2012–2016	
		Eight Key National Markets - 2012–2016	
13		creening Market by End User - 2012-1016	
		erview	
		ation Passengers Screening Market	
	13.2.1	Background	218

	13.	.2.2 Airport Passengers Screening Market - 2012-2016	219
	13.3	Land/Sea Transportation Passengers Screening Market	220
	13.	.3.1 Background	220
	13.	.3.2 Land/Sea Transportation Passengers Screening Market -	
		2012-2016	
		Land Border People Screening Market	
	13.	.4.1 Background	222
		.4.2 Land Border People Screening Market - 2012-2016	
		School Security People Screening Market	223
	13.6	Embassies and Consulates Visitors and Employees Screening	
		Market	
		.6.1 Background	224
	13.	.6.2 Embassies and Consulates People Screening Market - 2012-2016	224
	13.7	Prisons People Screening Market	225
		.7.1 Background	
	13.	.7.2 Prison Screening Market - 2012-2016	226
	13.8	Government Secured Facilities People Screening Markets	227
	13.	.8.1 Background	227
	13.	.8.2 Government Secured Facilities Market - 2012-2016	227
		Public Gathering Events People Screening Markets	
		Private Sector People Screening Market	
		.10.1 Background	
		.10.2 Private Sector People Screening Market - 2012-2016	
	13.11	Other Users People Screening Market	231
14	US M	arket – 2012–2016	233
	14.1	US homeland security: background	
	14.2	The US HLS Organizational Structure	
	14.3	The US Airport Security	
	14.4	The Transportation Security Administration	
	14.5	US People-Screening Market Background	238
	14.6	People Screening Market - 2012–2016	241
15	UK M	larket – 2012–2016	
	15.1	Homeland Security in the UK	
	15.2	The UK HLS Organizational Structure	
	15.3	Land Transportation Security Screening: Market Background	
	15.4	Maritime Security Screening: Market Background	247
	15.5	The UK Aviation Passengers and employees screening: Market	
		Background	
	15.6	UK Airport Security Screening vs. EU legislation	
	15.7	People Screening in Other Sectors	
	15.8	People Screening Market - 2012–2016	250
16	Germ	nan Market – 2012–2016	253
	16.1	Homeland Security in Germany	
	16.2	HLS Organizational Structure	253

	16.3	Aviation Security Screening: Market Background	
	16.4	Other People Screening: Market Background	
	16.5	People Screening Portals Market - 2012–2016	256
17	Span	ish Market – 2012–2016	258
	17.1	Homeland Security in Spain	
	17.2	HLS Organizational Structure	
	17.3	Maritime Screening: Market Background	259
	17.4	Aviation Screening: Market Background	259
	17.5	People Screening Market - 2012–2016	260
18	India	n Market – 2012–2016	262
	18.1	India, Economy and HLS Facts	
	18.2	HLS Organizational Structure	
	18.3	Airport Authority of India	
	18.4	People Screening Market Background	
	18.	.4.1 Public Transportation System	
		.4.2 Other People Screening Markets	
	18.5	India Local Security Industry	
	18.6	India People Screening Market - 2012–2016	268
19	Chine	ese Market – 2012–2016	270
	19.1	Economy and HLS Facts	
	19.2	HLS Organizational Structure	
	19.3	Aviation Security	
	19.4	People Screening Market Background	
	19.5	China People Screening Market - 2012–2016	273
20	Japai	nese Market – 2012–2016	275
	20.1	Japan HLS Organizational Structure	
	20.2	Aviation Security	
	20.3	People Screening Market Background	277
	20.	.3.1 Japan Public Transportation System	
		.3.2 Japan Border People Screening	
	20.4	Japan People Screening Market - 2012–2016	278
21	Brazi	lian Market – 2012–2016	281
	21.1	Economy and HLS Facts	
	21.2	Brazil Security Organizational Structure	
	21.3	Brazil Aviation Security	
	21.4	Brazil People Screening Market Background	283
	21.5	Brazil People Screening Market - 2012–2016	
22	Peop	le Screening Equipment Vendors	286
	22.1	Vendors and Product Lines	
	22.2	MilliVision	
	22.3	L-3 Communications Security & Detection Systems	289
	22.4	Rapiscan Security Products, Inc	
	22.5	Smiths Detection	
	22.6	QinetiQ Ltd	292

	22.7	Westminster International Ltd.	293
	22.8	American Science & Engineering, Inc	294
	22.9	ADANI	295
	22.10	General Electric Co.	296
	22.11	Red X Defense	297
	22.12	Syagen Technology	298
		Thermo Electron Corporation	
		Biosensor Applications	
		Hitachi	
	22.16	Scent Detection Technologies	302
		Ketech Defence	
	22.18	Mistral Security Inc	304
	22.19	Appealing Products, Inc. (API) / ChemSee	305
		DetectaChem LLC	
	22.21	Scintrex Trace	306
	22.22	ICx-Nomadics	307
	22.23	Ion Applications Inc	307
	22.24	BAHIA Corp (Sibel Ltd)	308
	22.25	CEIA	308
	22.26	Garrett Electronics Inc.	309
	22.27	Astrophysics Inc	309
	22.28	AutoClear	310
		Fisher Labs	
	22.30	Brijot Imaging Systems	311
	22.31	TeraView	312
	22.32	ThruVision Systems	313
23	Apper	ndix A: Covert Walk-by People Screening	314
	23.1	Walk-by Active Electromagnetic Weapons Detection Corridors	
	23.2	Passive Electro Magnetic Signature Corridor	
	23.3	Walk-by Passive MMWave Doorways	
	23.4	Focal Plane Array Passive MMWave	
	23.5	Walk-By Passive MMWave Imaging System	
	23.6	Walk-by Fourier Transform Infrared (FTIR) Spectroscopy Systems	
	23.7	Covert Walk-by Biometric Identification Corridors	
	_	Fused Standoff Video Surveillance and Biometrics	
		8.1 Example: IOM PassPort™	
0.4		·	
24		ndix B: People Profiling and Behavior Tracking	
	24.1	Scope	
		Profiling Types	
		2.1 Demographic Profiling	
		2.2 Ethnic Profiling	
		2.3 Behavioral Profiling	
		2.4 Positive Profiling and Robaviar Tracking	
		The Purpose of Profiling and Behavior Tracking	
		3.1 How It Is Done	
	24.	5.2 Deliavior Froming - Drivers	აა∠

People Screening Technologies & Global Markets - 2010-2014

	24.3.3 Behavior Profiling – Inhibitors	332
	24.3.4 The Cost of Profiling	
25	Appendix C: CCTV Based People Screening	333
	25.1 Video Monitoring and Biometrics	334
	25.2 CCTV Biometric Face Recognition Identification vs. Verification	334
	25.3 Performance of CCTV Based Biometric Recognition Technologies	334
	25.4 Tag and Track – Intelligent Video Surveillance	336
	25.5 TSA Advanced Surveillance Program	337
26	Appendix D: Abbreviations	338

List of Tables

Table 1 - Global People Screening Systems Sales [\$Million] by Modality - 2011-	
2016	27
Table 2 - Global People Screening Systems Sales [\$Million] by Region - 2011- 2016	28
Table 3 - People Screening Systems Sales [\$Million] by Key Countries - 2011-	20
2016	28
Table 4 - Global People Screening Portals Maintenance, Upgrade &	0
Refurbishment Market [\$Million] by Modality - 2011-2016	29
Table 5 - Global People Screening Portals: Systems Sales vs. Maintenance,	
Upgrade & Refurbishment Market [\$Million] - 2012–2016	30
Table 6 - Global People Screening Portals: Systems Sales market share vs.	
Maintenance, Upgrade & Refurbishment Market share [%] - 2012-	
2016	30
Table 7 - Global People Screening Market (Systems Sales, Maintenance, Upgrade	
& Refurbishment) [\$Million] by Modality - 2011-2016	30
Table 8 - Global People Screening Market (Systems Sales, Maintenance, Upgrade	
& Refurbishment) by End User [\$Million] - 2012-2016	32
Table 9 - Trace vs. Bulk Explosives Detection Technologies	51
Table 10 - Trace Explosive Detection Technologies	
Table 11 - ETD Portals – Sensor Technology Comparison	59
Table 12 - Explosives Trace Detection Portals - Technology Comparison	60
Table 13 - Comparison of Backscatter Body Scanner vs. ETD Portal Technologies	
Table 14 -Trace Explosive Detection Portals – Vendors/Products/Prices	
Table 15 - Trace Detection – Pros and Cons	66
Table 16 - Hand-Held Trace Explosives Detectors - Cost Performance Analysis	66
(24/7)	00
Table 17 - DHS Approved Tabletop ETD Systems Performance	
Table 18 - Desktop ETD Systems: Vendors, Products, Technology and Prices	
Table 20 - Hand-Held ETD Systems: Vendors, Products, Technology and Prices	
Table 20 - Fland-field ETD Systems. Vehiclis, Froducts, Technology and Frices Table 21 - Trace Detection Document Scanners	70 70
Table 22 - Backscatter People Screening Portals – Advantages & Disadvantages	
Table 23 - Reflectivity of Basic Explosives and Human Flesh	
Table 24 - Examples of Object Emissivity	
Table 25 - Active MMWave Screening Systems – Advantages & Disadvantages	
Table 26 - Whole Body Scanners: Products, Vendors and Technology	
Table 27 - Magnetism and Detection Capabilities	
Table 28 - Conductivity and Detection Capabilities	
Table 29 - Metal Detection Portals: Products, Vendors, and Prices	
Table 30 - Shoe Scanners Vendors, Products & Prices,	
Table 31 - Liquid Explosives Scanners – Vendors/Products/Prices	102
Table 32 - Global Biometric Technology Share - by Technology - 2008	
Table 33 - Global People Screening Systems Sales [\$Million] by Modality - 2011-	
2016	135

Table 34 - Global People Screening Systems Sales [\$Million] by Region - 2011- 2016	137
Table 35 - People Screening Systems Sales [\$Million] by Key Countries - 2011- 2016	138
Table 36 - Global People Screening Portals Maintenance, Upgrade &	130
Refurbishment Market [\$Million] by Modality - 2011-2016	139
Table 37 - Global People Screening Portals: Systems Sales vs. Maintenance,	
Upgrade & Refurbishment Market [\$Million] - 2012–2016	140
Table 38 - Global People Screening Portals: Systems Sales market share vs. Maintenance, Upgrade & Refurbishment Market share [%] - 2012–	4 4 4
2016	141
· · · · · · · · · · · · · · · · · · ·	142
Table 40 - Global ETD Portals & Devices Sales [\$Million] by Sector - 2011-2016	
Table 41 - Global ETD Portals & Devices Maintenance, Upgrade & Refurbishment	
Market [\$Million] by Sector - 2011-2016	146
Table 42 - Global ETD Portals & Devices - Consolidated (Systems Sales,	
Maintenance, Upgrade & Refurbishment) Market [\$Million] by Sector	
	147
Table 44 - EU ETD Portals & Devices Market [\$Million] by Sector - 2012–2016	149
Table 45 - Middle East ETD Portals & Devices Market [\$Million] by Sector - 2011- 2016	150
Table 46 - China, India, Japan ETD Portals & Devices Market [\$Million] by Sector -	
2011-2016	151
Table 47 - ROW ETD Portals & Devices Market [\$Million] by Sector - 2011-2016	
Table 48 - Global ETD Portals & Devices Sales [\$Million] by Region - 2011-2016	153
Table 49 - Global ETD Portals & Devices Maintenance, Upgrade & Refurbishment	155
Market [\$Million] by Region - 2011-2016	155
Maintenance, Upgrade & Refurbishment) Market [\$Million] by Region	
- 2011-2016	156
Table 51 - ETD Portals & Devices Sales: Eight Key National Markets [\$Million] -	.00
2011-2016	158
Table 52 - Global Whole Body (AIT) Scanning Systems Sales [\$Million] by Sector -	
2011-2016	159
Table 53 - Global Whole Body Scanners Maintenance, Upgrade & Refurbishment	
Market [\$Million] by Sector - 2011-2016	160
Table 54 - Global Whole Body Scanners - Consolidated (Systems Sales,	
Maintenance, Upgrade & Refurbishment) Market [\$Million] by Sector	
2011 2016	
- 2011-2016	161
Table 55 - US Whole Body (AIT) Scanning Systems Market [\$Million] by Sector -	
Table 55 - US Whole Body (AIT) Scanning Systems Market [\$Million] by Sector - 2011-2016	
Table 55 - US Whole Body (AIT) Scanning Systems Market [\$Million] by Sector -	163

Table 57 - Middle East Whole Body (AIT) Scanning Systems Market [\$Million] by Sector - 2011-2016	. 165
Table 58 - China, India, Japan Whole Body (AIT) Scanning Systems Market [\$Million] by Sector - 2011-2016	. 166
Table 59 - ROW Whole Body (AIT) Scanning Systems Market [\$Million] by Sector - 2011-2016	. 160
Table 60 - Global Whole Body (AIT) Scanning Systems Sales [\$Million] by Region - 2011-2016	. 168
Table 61 - Global Whole Body Scanners Maintenance, Upgrade & Refurbishment Market [\$Million] by Region - 2011-2016	. 169
Table 62 - Global Whole Body Scanners - Consolidated (Systems Sales, Maintenance, Upgrade & Refurbishment) Market [\$Million] by Region - 2011-2016	. 171
Table 63 - Whole Body Scanners Systems Sales: Eight Key National Markets [\$Million] - 2011-2016	. 172
Table 64 - Global Metal Detection Portals & Devices Sales [\$Million] by Sector - 2011-2016	. 173
Table 65 - Global Metal Detection Portals & Devices Maintenance, Upgrade & Refurbishment Market [\$Million] by Sector - 2011-2016	. 175
Table 66 - Global Metal Detection Portals & Devices - Consolidated (Systems Sales, Maintenance, Upgrade & Refurbishment) Market [\$Million] by Sector - 2011-2016	. 176
Table 67 - US Metal Detection Portals & Devices Systems Market [\$Million] by Sector - 2011-2016	
Table 68 - Middle East Metal Detection Portals & Devices Systems Market [\$Million] by Sector - 2011-2016	
Table 69 - China, India, Japan Metal Detection Portals & Devices Systems Market [\$Million] by Sector - 2011-2016	. 180
Table 70 - ROW Metal Detection Portals & Devices Systems Market [\$Million] by Sector - 2011-2016	. 181
Table 71 - Global Metal Detection Portals & Devices Systems Sales [\$Million] by Region - 2011-2016	. 182
Table 72 - Global Metal Detection Portals & Devices - Consolidated (Systems Sales, Maintenance, Upgrade & Refurbishment) Market [\$Million] by	405
Region - 2011-2016 Table 73 - Metal Detection Systems Sales: Eight Key National Markets [\$Million] - 2011-2016	
Table 74 - Global Shoe Scanning - Consolidated (Systems Sales, Maintenance, Upgrade & Refurbishment) Market [\$Million] by Segment - 2011-2016	
Table 75 - Global Shoe Scanning Systems Sales [\$Million] by Region - 2011-2016 Table 76 - Global Shoe Scanning Maintenance, Upgrade & Refurbishment Market [\$Million] by Region - 2011-2016	. 189
Table 77 - Global Shoe Scanning - Consolidated (Systems Sales, Maintenance, Upgrade & Refurbishment) Market [\$Million] by Region - 2011-2016	

Table 78 - Shoe Scanning Systems Sales: Eight Key National Markets [\$Million] - 2011-2016	.194
Table 79 - Global Liquid Explosives Scanners - Consolidated (Systems Sales,	
Maintenance, Upgrade & Refurbishment) Market [\$Million] by Sector	
- 2011-2016	195
Table 80 - Global Liquid Explosives Scanners Sales [\$Million] by Region - 2011-	
2016	196
Table 81 - Global Liquid Explosives Scanners Maintenance, Upgrade &	
Refurbishment Market [\$Million] by Region - 2011-2016	198
Table 82 - Global Liquid Explosives Scanners - Consolidated (Systems Sales,	
Maintenance, Upgrade & Refurbishment) Market [\$Million] by Region	
- 2011-2016	199
Table 83 - Liquid Explosives Scanners Sales: Eight Key National Markets	
[\$Million] - 2011-2016	201
Table 84 - Global Multi-Modal & Multi-Threat Portals Sales [\$Million] by Sector -	
2011-2016	202
Table 85 - Global Multi-Modal & Multi-Threat Portals Maintenance, Upgrade &	
Refurbishment Market [\$Million] by Sector - 2011-2016	203
Table 86 - Global Multi-Modal & Multi-Threat Portals - Consolidated (Systems	
Sales, Maintenance, Upgrade & Refurbishment) Market [\$Million] by	
Sector - 2011-2016	204
Table 87 - US Multi-Modal & Multi-Threat Portals - Systems Market [\$Million] by	
Sector - 2011-2016	206
Table 88 - EU Multi-Modal & Multi-Threat Portals - Systems Market [\$Million] by	
Sector - 2012–2016	207
Table 89 - Middle East Multi-Modal & Multi-Threat Portals - Systems Market	
[\$Million] by Sector - 2011-2016	208
Table 90 - China, India, Japan Multi-Modal & Multi-Threat Portals - Systems	
Market [\$Million] by Sector - 2011-2016	209
Table 91 - ROW Multi-Modal & Multi-Threat Portals - Systems Market [\$Million] by	
Sector - 2011-2016	210
Table 92 - Global Multi-Modal & Multi-Threat Portals Sales [\$Million] by Region -	
	211
Table 93 - Global Multi-Modal & Multi-Threat Portals Maintenance, Upgrade &	
Refurbishment Market [\$Million] by Region - 2011-2016	212
Table 94 - Global Multi-Modal & Multi-Threat Portals - Consolidated (Systems	
Sales, Maintenance, Upgrade & Refurbishment) Market [\$Million] by	
Region - 2011-2016	214
Table 95 - Multi-Modal & Multi-Threat Portals Sales: Eight Key National Markets	
[\$Million] - 2011-2016	215
Table 96 - Global People Screening Market (Systems Sales, Maintenance,	
Upgrade & Refurbishment) by End User [\$Million] - 2012-2016	217
Table 97 - Private Sector Security Segments	230
Table 98 - TSA Budget and Its Aviation Security Component - 2001-2011	237
Table 99 - Inhibitors to Effective Deployment	

Table 100 - People Screening Systems Sales [\$Million] by Modality - 2011-2016 -	
US	241
Table 101 - Terminal Passengers [Million] forecast at UK Airports	248
Table 102 - People Screening Systems Sales [\$Million] by Modality - 2011-2016 - UK	250
Table 103 - People Screening Systems Sales [\$Million] by Modality - 2011-2016 - Germany	256
Table 104 - People Screening Systems Sales [\$Million] by Modality - 2011-2016 - Spain	260
Table 105 - India People Screening Systems Sales [\$Million] by Modality - 2011- 2016	268
Table 106 - China People Screening Systems Sales [\$Million] by Modality - 2011- 2016	273
Table 107 - People Screening Systems Sales [\$Million] by Modality - 2011-2016 - Japan	278
Table 108 - People Screening Systems Sales [\$Million] by Modality - 2011-2016 - Brazil	284
Table 109 - People Screening Vendors and Product Lines	286
Table 110 - Retica Standoff Biometric; System Performance	
Table 111 - Short Range Standoff Biometric Portal: IOM PassPort™ Performance	

List of Figures

Figure 1 - Global People Screening Market (Systems Sales, Maintenance,	
Upgrade & Refurbishment) [\$Million] by Modality - 2011-2016	32
Figure 2 - Global People Screening Market (Systems Sales, Maintenance,	
Upgrade & Refurbishment) [%] by Modality - 2011 & 2016	32
Figure 3 - Global People Screening Market Share (Systems Sales, Maintenance,	
Upgrade & Refurbishment) by End User [%] – 2012 & 2016	33
Figure 4 - People Screening Technologies - Threats and Associated Detection	
Technologies	35
Figure 5 - Airport People Screening Vectors	37
Figure 6 - SWOT Analysis	
Figure 7 - People Screening Market - Competitive Analysis	
Figure 8 - People Screening Technology & Products Performance Criteria	
Figure 9 - Trace Detection General Principle of Operation	
Figure 10 - Tabletop ETD: Operational Workflow	50
Figure 11 - Explosives Trace Detection Technologies	51
Figure 12 - The Airborne Concentration of Various Explosives	53
Figure 13 - Typical Sensitivity of Various Explosive Trace Detection Technologies	53
Figure 14 - Ion Mobility Spectroscopy (IMS)	54
Figure 15 - Electron Capture Detectors (ECD)	55
Figure 16 - Surface Acoustic Wave (SAW) Detectors	56
Figure 17 - ETD People Screening Portals	
Figure 18 - ETD People Screening Portals - Principle of Operation	59
Figure 19 - Trace Detection General Principle of Operation	
Figure 20 - Tabletop ETD Devices	
Figure 21 - Dose Comparison: Environmental Radiation vs. Backscatter Scan	
Figure 22 - Spectrum of MMWave Technologies	
Figure 23 - Active MMWave Imaging Technology – Principles of Operation	
Figure 24 - A Passive MMWave Whole-Body Scanner Layout	
Figure 25 - Passive MMWave Scanner: Typical Threat Images	
Figure 26 - Electromagnetic Spectrum of the THz-Region	
Figure 27 - Hand-Held Weapon Detector – Proper Scanning Path	
Figure 28 - Single Zone Metal Detection Portal Technology	
Figure 29 - Walk-through metal-detection portals Technologies	
Figure 30 - Passive Magnetic Weapon-Detection Portal	
Figure 31 - Metal Detection Portals	95
Figure 32 - Multiple-image Radiography (MIR) Technology	
Figure 33 - MIR Projection Images, vs. Conventional Radiography	
Figure 34 - a Conventional Radiograph vs. DEXI Technology	
Figure 35 - Biometric Identification, Drivers & Inhibitors and Government Influence	
Figure 36 - Global Biometric by Technology Share [%] – 2009	
Figure 37 - Model of GE Checkpoint of the Future	
Figure 38 - Cast and artificial limbs screening system	114

Figure 39 - A prosthetic limbs backscatter image showing a gun hidden	
underneath a cast	
Figure 40 - SNL - ETD MicroChemLab on a Chip.	119
Figure 41 - Components of SNL MicroHound Trace Explosives Detection System	120
Figure 42 - Ames 'Conductive CNT Explosives Detector'	
Figure 43 - Future Screening Checkpoint (HSRC 2002 forecast)	124
Figure 44 - Future Multi-Threat People Screening Checkpoint - (HSRC 2002	
concept)	
Figure 45 - Airport Pre Screening Program Process	
Figure 46 - Airport CBP Pre-Screening Systems and Data Flow	126
Figure 47 - IATA 2011 "Checkpoint of the Future" Concept	126
Figure 48 - Fused Technologies- Concealed Weapons Detection	128
Figure 49 - Molecular Imprinting Technique	129
Figure 50 - The "checkpoint of the future" lanes	132
Figure 51 - The "checkpoint of the future"	133
Figure 52 - "checkpoint of the future" biometric card-passport reading station	133
Figure 53 - "checkpoint of the future" Lane 1	133
Figure 54 - "checkpoint of the future" Lane 2	134
Figure 55 - "checkpoint of the future" Lane 3	134
Figure 56 - Global People Screening Systems Sales [\$Million] by Modality - 2011-	
2016	137
Figure 57 - Global People Screening Systems Sales Market Share [%] by Modality	
- 2011 & 2016	137
Figure 58 - Global People Screening Systems Sales [%] by Region - 2011 & 2016	138
Figure 59 - Global People Screening Portals Maintenance, Upgrade &	
Refurbishment Market [\$Million] by Modality - 2011-2016	140
Figure 60 - Global People Screening Portals Maintenance, Upgrade &	
Refurbishment Market [%] by Modality - 2011 & 2016	141
Figure 61 - Global People Screening Portals Maintenance, Upgrade &	
Refurbishment Market vs. Systems Sales Market [\$Million] - 2012-	
2016	142
Figure 62 - Global People Screening Portals Maintenance, Upgrade &	
Refurbishment vs. Systems Sales Market Share [%] - 2012–2016	143
Figure 63 - Global People Screening Market (Systems Sales, Maintenance,	
Upgrade & Refurbishment) [\$Million] by Modality - 2011-2016	144
Figure 64 - Global People Screening Market (Systems Sales, Maintenance,	
Upgrade & Refurbishment) [%] by Modality - 2011 & 2016	
Figure 65 - Global ETD Portals & Devices Sales [\$Million] by Sector - 2011-2016	146
Figure 66 - Global ETD Portals & Devices Sales [%] by Sector - 2011 & 2016	146
Figure 67 - Global ETD Portals & Devices Maintenance, Upgrade & Refurbishmen	
Market [\$Million] by Sector - 2011-2016	147
Figure 68 - Global ETD Portals & Devices - Consolidated (Systems Sales,	
Maintenance, Upgrade & Refurbishment) Market [\$Million] by Sector	
- 2011-2016	148

Figure 69 - Global ETD Portals & Devices - Consolidated (Systems Sales, Maintenance, Upgrade & Refurbishment) Market [%] by Sector -	
, , , , , , , , , , , , , , , , , , , ,	149
Figure 70 - US ETD Portals & Devices Market [\$Million] by Sector - 2011-2016	_
Figure 71 - EU ETD Portals & Devices Market [\$Million] by Sector - 2012–2016	
Figure 72 - Middle East ETD Portals & Devices Market [\$Million] by Sector - 2011-	
	152
Figure 73 - China, India, Japan ETD Portals & Devices Market [\$Million] by Sector	
	153
Figure 74 - ROW ETD Portals & Devices Market [\$Million] by Sector - 2011-2016	154
Figure 75 - Global ETD Portals & Devices Sales [\$Million] by Region - 2011-2016	155
Figure 76 - Global ETD Portals & Devices Sales [\$Million] by Region - 2011 &	
2016	155
Figure 77 - Global ETD Portals & Devices Maintenance, Upgrade & Refurbishment	
	156
Figure 78 - Global ETD Portals & Devices Maintenance, Upgrade & Refurbishment	
Market [\$Million] by Region - 2011 & 2016	157
Figure 79 - Global ETD Portals & Devices - Systems and Maintenance, Upgrade &	
Refurbishment Market [\$Million] by Region - 2011-2016	158
Figure 80 - Global ETD Portals & Devices - Systems and Maintenance, Upgrade &	
	158
Figure 81 - ETD Portals & Devices Sales: Eight Key National Markets [\$Million] -	450
2011-2016	
Figure 82 - Global Whole Body Scanners Sales [\$Million] by Sector - 2011-2016	
Figure 83 - Global Whole Body Scanners Sales [%] by Sector - 2011 & 2016	161
Figure 84 - Global Whole Body Scanners Maintenance, Upgrade & Refurbishment	160
L' J	162
Figure 85 - Global Whole Body Scanners - Consolidated (Systems Sales,	
Maintenance, Upgrade & Refurbishment) Market [\$Million] by Sector - 2011-2016	163
Figure 86 - Global Whole Body Scanners - Consolidated (Systems Sales,	103
Maintenance, Upgrade & Refurbishment) Market [%] by Sector -	
, , , , , , , , , , , , , , , , , , , ,	163
Figure 87 - US Whole Body (AIT) Scanning Systems Market [\$Million] by Sector -	100
2011-2016	164
Figure 88 - EU Whole Body (AIT) Scanning Systems Market [\$Million] by Sector -	104
2009–2016	165
Figure 89 - Middle East Whole Body (AIT) Scanning Systems Market [\$Million] by	
Sector - 2011-2016	166
Figure 90 - China, India, Japan Whole Body (AIT) Scanning Systems Market	
[\$Million] by Sector - 2011-2016	167
Figure 91 - ROW Whole Body (AIT) Scanning Systems Market [\$Million] by Sector	
- 2011-2016	168
Figure 92 - Global Whole Body Scanners Systems Sales [\$Million] by Region -	
2011-2016	169

Figure	93 -	Global Whole Body Scanners Systems Sales [\$Million] by Region - 2011 & 2016	. 170
Figure	94 -	Global Whole Body Scanners Maintenance, Upgrade & Refurbishment	
		Market [\$Million] by Region - 2011-2016	. 171
Figure	95 -	Global Whole Body Scanners Maintenance, Upgrade & Refurbishment	
		Market [\$Million] by Region - 2011 & 2016Total Market by Region -	
		2012–2016	. 171
Figure	96 -	Global Whole Body Scanners - Systems and Maintenance, Upgrade &	
	_	Refurbishment Market [\$Million] by Region - 2011-2016	. 172
Figure	97 -	Global Whole Body Scanners - Systems and Maintenance, Upgrade &	
		Refurbishment Market [%] by Region - 2011 & 2016	. 173
Figure	98 -	Whole Body Scanners Systems Sales: Eight Key National Markets	4-7-4
-	00	[\$Million] - 2011-2016	.1/4
Figure	99 -	Global Metal Detection Portals & Devices Sales [\$Million] by Sector -	475
Figure	100	2011-2016	. 175
rigure	100	- Global Metal Detection Portals & Devices Sales [%] by Sector - 2011 & 2016	.175
Figure	101	- Global Metal Detection Portals & Devices Maintenance, Upgrade &	. 175
i igui e	101	Refurbishment Market [\$Million] by Sector - 2011-2016	176
Figure	102	- Global Metal Detection Portals & Devices - Consolidated (Systems	. 170
rigaro	102	Sales, Maintenance, Upgrade & Refurbishment) Market [\$Million] by	
		Sector - 2011-2016	. 177
Figure	103	- Global Metal Detection Portals & Devices - Consolidated (Systems	
J		Sales, Maintenance, Upgrade & Refurbishment) Market [w] by	
		Sector - 2011 & 2016	.178
Figure	104	- US Metal Detection Portals & Devices Systems Market [\$Million] by	
		Sector - 2011-2016	. 179
Figure	105	- EU Metal Detection Portals & Devices Systems Market [\$Million] by	
		Sector - 2012–2016	. 179
Figure	106	- EU Metal Detection Portals & Devices Systems Market [\$Million] by	
- :	407	Sector - 2012–2016	.180
Figure	107	- Middle East Metal Detection Portals & Devices Systems Market	101
Figure	100	[\$Million] by Sector - 2011-2016	. 181
rigure	100	- China, India, Japan Metal Detection Portals & Devices Systems Market [\$Million] by Sector - 2011-2016	100
Eiguro	100	- ROW Metal Detection Portals & Devices Systems Market [\$Million]	. 102
riguie	109	by Sector - 2011-2016	.183
Figure	110	- Global Metal Detection Portals & Devices Systems Sales [\$Million]	. 100
i igaio	110	by Region - 2011-2016	.184
Figure	111	- Global Metal Detection Portals & Devices Systems Sales [\$Million]	
g 3 3	- •	by Region - 2011 & 2016	. 184
Figure	112	- Global Metal Detection Portals & Devices Maintenance, Upgrade &	
J		Refurbishment Market [\$Million] by Region - 2011-2016	. 185
Figure	113	- Global Metal Detection Portals & Devices Maintenance, Upgrade &	
-		Refurbishment Market [\$Million] by Region - 2011-2016	. 185

Figure 114 - Global Metal Detection Portals & Devices Maintenance, Upgrade & Refurbishment Market [\$Million] by Region - 2011 & 2016	186
Figure 115 - Global Metal Detection Portals & Devices - Systems and	100
Maintenance, Upgrade & Refurbishment Market [\$Million] by Region - 2011-2016	187
Figure 116 - Global Metal Detection Portals & Devices - Systems and	
Maintenance, Upgrade & Refurbishment Market [%] by Region -	
2011 & 2016	187
Figure 117 - Metal Detection Systems Sales: Eight Key National Markets [\$Million] - 2011-2016	188
Figure 118 - Global Shoe Scanning - Consolidated (Systems Sales, Maintenance, Upgrade & Refurbishment) Market [\$Million] by Sector - 2011-2016	189
Figure 119 - Global Shoe Scanning - Consolidated (Systems Sales, Maintenance,	
Figure 120 - Global Shoe Scanning Systems Sales [\$Million] by Region - 2011-	
	191
Figure 121 - Global Shoe Scanning Systems Sales [\$Million] by Region - 2011 & 2016	191
Figure 122 - Global Shoe Scanning Maintenance, Upgrade & Refurbishment	
	192
Figure 123 - Global Shoe Scanning Maintenance, Upgrade & Refurbishment	400
1, 1, 0	193
Figure 124 - Global Shoe Scanning - Systems and Maintenance, Upgrade & Refurbishment Market [\$Million] by Region - 2011-2016	194
Figure 125 - Global Shoe Scanning - Systems and Maintenance, Upgrade &	194
Refurbishment Market [%] by Region - 2011 & 2016	194
Figure 126 - Shoe Scanning Systems Sales: Eight Key National Markets [\$Million] - 2011-2016	195
Figure 127 - Global Liquid Explosives Scanners - Consolidated (Systems Sales,	195
Maintenance, Upgrade & Refurbishment) Market [\$Million] by Sector	
	196
Figure 128 - Global Liquid Explosives Scanners - Consolidated (Systems Sales,	
Maintenance, Upgrade & Refurbishment) Market [%] by Sector -	
2011 & 2016	197
Figure 129 - Global Liquid Explosives Scanners Sales [\$Million] by Region - 2011-	
2016	198
Figure 130 - Global Liquid Explosives Scanners Sales [\$Million] by Region - 2011 & 2016	198
Figure 131 - Global Liquid Explosives Scanners Maintenance, Upgrade &	
Refurbishment Market [\$Million] by Region - 2011-2016	199
Figure 132 - Global Liquid Explosives Scanners Maintenance, Upgrade &	
Refurbishment Market [\$Million] by Region - 2011 & 2016	200
Figure 133 - Global Liquid Explosives Scanners - Systems and Maintenance,	001
Upgrade & Refurbishment Market [\$Million] by Region - 2011-2016	201
Figure 134 - Global Liquid Explosives Scanners - Systems and Maintenance, Upgrade & Refurbishment Market [%] by Region - 2011 & 2016	201
UDUIAUE & REIUIDISHHEHLIVIAIKELIMI DV REUIOH - ZUTT & ZUTD	_U I

Figure 135 -	Liquid Explosives Scanners Sales: Eight Key National Markets [\$Million] - 2011-2016	202
Figure 136 -	Global Multi-Modal & Multi-Threat Portals Sales [\$Million] by Sector -	
Figure 137 -	Global Multi-Modal & Multi-Threat Portals Sales [%] by Sector - 2011	203
Figure 138 -	Global Multi-Modal & Multi-Threat Portals Maintenance, Upgrade & Refurbishment Market [\$Million] by Sector - 2011-2016	205
Figure 139 -	Global Multi-Modal & Multi-Threat Portals - Consolidated (Systems Sales, Maintenance, Upgrade & Refurbishment) Market [\$Million] by	206
Figure 140 -	Global Multi-Modal & Multi-Threat Portals - Consolidated (Systems Sales, Maintenance, Upgrade & Refurbishment) Market [%] by Sector - 2011 & 2016	206
Figure 141 -	US Multi-Modal & Multi-Threat Portals - Systems Market [\$Million] by Sector - 2011-2016	207
Figure 142 -	EU Multi-Modal & Multi-Threat Portals - Systems Market [\$Million] by Sector - 2012–2016	208
Figure 143 -	Middle East Multi-Modal & Multi-Threat Portals - Systems Market	209
Figure 144 -	China, India, Japan Multi-Modal & Multi-Threat Portals - Systems	210
Figure 145 -	ROW Multi-Modal & Multi-Threat Portals - Systems Market [\$Million]	211
Figure 146 -	Global Multi-Modal & Multi-Threat Portals Sales [\$Million] by Region	212
Figure 147 -	Global Multi-Modal & Multi-Threat Portals Sales [\$Million] by Region - 2011 & 2016	213
Figure 148 -	Global Multi-Modal & Multi-Threat Portals Maintenance, Upgrade & Refurbishment Market [\$Million] by Region - 2011-2016	214
Figure 149 -	Global Multi-Modal & Multi-Threat Portals Maintenance, Upgrade &	214
Figure 150 -	Global Multi-Modal & Multi-Threat Portals - Systems and Maintenance, Upgrade & Refurbishment Market [\$Million] by Region - 2011-2016	215
Figure 151 -	Global Multi-Modal & Multi-Threat Portals - Systems and Maintenance, Upgrade & Refurbishment Market [%] by Region - 2011 & 2016	
Figure 152 -	Multi-Modal & Multi-Threat Portals Systems Sales: Eight Key National	
Figure 153 -	Global People Screening Market (Systems Sales, Maintenance, Upgrade & Refurbishment) by End User [\$Million] - 2012-2016	
Figure 154 -	Global People Screening Market Share (Systems Sales, Maintenance, Upgrade & Refurbishment) by End User [%] – 2012 & 2016	.219

Figure	155 -	 Airport Passengers Screening Market (Systems Sales, Maintenance, 	
		Upgrade & Refurbishment) by End User [\$Million] - 2012-2016	.221
Figure	156 -	 Land/Sea Transportation Passengers Screening Market (Systems 	
		Sales, Maintenance, Upgrade & Refurbishment) by End User	
		[\$Million] - 2012-2016	.223
Figure	157 -	Land Border Screening Market (Systems Sales, Maintenance,	
9		Upgrade & Refurbishment) by End User [\$Million] - 2012-2016	.224
Figure	158 -	Land Border Screening Market (Systems Sales, Maintenance,	
9		Upgrade & Refurbishment) by End User [\$Million] - 2012-2016	. 225
Figure	159.	- Embassies and Consulates Screening Market (Systems Sales,	
i iguio	100	Maintenance, Upgrade & Refurbishment) by End User [\$Million] -	
		2012-2016	.226
Figure	160 .	- Prison Screening Market (Systems Sales, Maintenance, Upgrade &	. 220
rigure	100	Refurbishment) by End User [\$Million] - 2012-2016	.227
Figuro	161	, ,	. 221
rigure	101.	Government Secured Facilities Screening Market (Systems Sales,	
		Maintenance, Upgrade & Refurbishment) by End User [\$Million] -	000
-	400	2012-2016	. 228
Figure	162 -	Public Gathering Events People Screening Market (Systems Sales,	
		Maintenance, Upgrade & Refurbishment) by End User [\$Million] -	
		2012-2016	. 229
Figure	163 -	Private Sector People Screening Market (Systems Sales,	
		Maintenance, Upgrade & Refurbishment) by End User [\$Million] -	
		2012-2016	. 232
Figure	164 -	- Airport Passengers Screening Market (Systems Sales, Maintenance,	
		Upgrade & Refurbishment) by End User [\$Million] - 2012-2016	.233
Figure	165 -	· TSA Organizational Chart	.237
Figure	166 -	- TSA Budget Structure [%]	.238
		People Screening Systems Sales [\$Million] by Modality - 2011-2016 -	
Ū		US	. 243
Figure	168 -	People Screening Systems Sales [%] by Modality – 2011 & 2016 –	
		US	. 244
Figure	169 -	- UK Homeland Security, Homeland Defense and Counter Terror	
. iguio	.00	Intelligence Organizational Chart	.247
Figure	170 .	People Screening Systems Sales [\$Million] by Modality - 2011-2016 -	. 271
riguic	170		.252
Eiguro	171	UK - People Screening Systems Sales [%] by Modality – 2011 & 2016 - UK	_
_			. 200
riguie	112.	The German Homeland Security, Homeland Defence and Counter	. 255
Гіанка	170	Terror Intelligence Organization Chart	. 200
rigure	1/3	People Screening Systems Sales [\$Million] by Modality - 2011-2016 –	050
-	4-7-4	Germany	. 258
Figure	1/4 -	People Screening Systems Sales [%] by Modality - 2011 & 2016 –	050
_ .	4	Germany	. 258
⊢ıgure	1/5	- Spanish Homeland Security, Homeland Defense and Counter Terror	.
		Intelligence Organizational Chart	. 259
Figure	176 -	People Screening Systems Sales [\$Million] by Modality - 2011-2016 -	
		Spain	. 262

Figure 177 - People Screening Systems Sales [%] by Modality - 2011 & 2016 - Spain	262
Figure 178 - Indian Homeland Security, Homeland Defense and Counter Terror	
Intelligence Organizational Chart	264
Figure 179 - Bureau of Civil Aviation Security Organizational Chart	266
Figure 180 - People Screening Systems Sales [\$Million] by Modality - 2011-2016 - India	270
Figure 181 - People Screening Systems Sales [%] by Modality - 2011 & 2016 -	210
India	270
Figure 182 - China Internal Security and Intelligence community Organizational	0
Chart	271
Figure 183 - People Screening Systems Sales [\$Million] by Modality - 2011-2016 -	
China	275
Figure 184 - People Screening Systems Sales [%] by Modality - 2011 & 2016 -	
China	275
Figure 185 - Japanese Homeland Security, Homeland Defense and Counter	
Terror Intelligence Organizational Chart	276
Figure 186 - People Screening Systems Sales [\$Million] by Modality - 2011-2016 -	
Japan	280
Figure 187 - People Screening Systems Sales [%] by Modality - 2011 & 2016 -	
Japan	281
Figure 188 - Brazilian Security organization	283
Figure 189 - People Screening Systems Sales [\$Million] by Modality - 2011-2016 -	
Brazil	286
Figure 190 - People Screening Systems Sales [%] by Modality - 2011 & 2016 -	
Brazil	286
Figure 191 - Standoff Electromagnetic Concealed Weapons Detection	315
Figure 192 - Magnetic Signature Analysis System: Functional Block Diagram	
Figure 193 - Covert MMWave Sensor at a Door	317
Figure 194 - Screening of Hand-held Baggage	
Figure 195 - Focal Plane Array Passive Standoff MMWave System	318 319
Figure 196 - A Walk-By Passive MMWave Imaging System	
Figure 197 - Covert Walk-By Passive MMWave Images	
Figure 199 - Biometric People Screening Corridor	
Figure 200 - Field of View of a Fused Video Surveillance and Biometrics	
Figure 201 - A Corridor CCTV & Biometric Portal Layout	
Figure 202 - Future People/Baggage Screening Turnstiles (Artist Rendition)	
Figure 203 - Profiling and Behavior Tracking – Principles of Operation	
g =	