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Editorial

As transformative technologies continue to shape and impact our world, there have been a number of specific trends over the past year, which will continue through 2018, with further growth in artificial intelligence, the IoT, connectivity in the cloud and blockchain. Other areas include machine vision, robotics and drones.

In the area of artificial intelligence, studies predict that by 2035, AI technologies will have the potential to increase productivity 40 percent or more. Information and communication, manufacturing and financial services will be among the various industries benefiting from AI technology from now to 2035. In addition, it is predicted that AI will have positive effect on profitability in education, leisure, food services and construction up until 2035.



Meanwhile, cloud adoption across the globe is skyrocketing, with 85 percent of enterprises using a multicloud strategy and 58 percent leveraging hybrid cloud, according to industry figures. Cloud is transforming the traditional IT model with new strategies for cost efficiency and business versatility. In biometrics for example, there is a move towards server-side authentication in the cloud rather than on-device.

Among other promising developments in IT, blockchain technology is being viewed as revolutionary in the sense of being a decentralized consensus network that is resistant to manipulation or takeover by a central authority. As a result, investments by FinTech startups, financial institutions and technology companies are accelerating.

In support of this, smart card and secure element technologies are providing blockchain application implementers with a standards-based security platform and established standardized security evaluation and certification programs for access and management.

The global machine vision market is expected to reach USD 19.22 billion by 2025, according to researchers. They say the ability of machine vision systems to process a large amount of information in a fraction of a second is a major factor driving the market growth. In addition, the increasing adoption of robots across industrial sectors is leading toward the application of vision-guided robotic systems. Industrial verticals, such as automotive, pharmaceutical and packaging, where robotic systems are used prominently, could eventually fuel the demand for machine vision systems.

As these various combinations of technologies, innovations and new infrastructures continue to evolve and grow, the four core identification technologies – Cards, Biometrics, RFID and Data Collection – are still enabling the developments we see in today's digital world. Smart cards and biometrics in particular are the cornerstones of identity and security – whether physical, on-device or in the cloud.

In this issue we explore many of these new and emerging trends with a focus on technology suppliers who play a major role in their application.

Enjoy!

Sophie Boyer de la Giroday



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Viewpoint: An opinion on the borderless concept in terms of whether new frontiers which are arising as a result of new administrations, cyber attacks and major change in the European Union, mean a shift in the strive for true globalization. Brexit, immigration control, President Trump's commitment to build physical walls or the creation of digital borders in EU cyberspace are looked at in the context of political, economic and social change.



A look at the issue of sovereignty in cyber-space with reference to an ongoing case between Microsoft and the US Supreme Court. Concerns discussed cover how States can ensure their own safety by providing judicial authorities an easy access to digital data and how businesses can ensure they have the tools for digital transformation.



An overview of blockchain technology and its continued to evolvement, with particular reference to how secure element and smart card technology is playing a critical role in securing blockchain transactions in certain use cases. These cases include crypto-currencies, such as Bitcoins as well as vaults, funds transfer, asset tracking and the impact blockchain is having on Internet of Things. It is further envisioned that smart card technology, in partnership with blockchain technology, can enable straight-through transactions with dramatic improvements in safety, security, and integrity.



2018 BUYER'S GUIDE

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New frontiers: borders or barriers in a globalized world?

Border issues have once again become prominent in international political discourse and public sentiment - whether over Brexit, immigration control, the American President's commitment to build physical walls or the creation of digital borders in cyberspace. In spite of globalization, is the aspiration of a borderless world becoming myth?



With the progressive disappearance of trade barriers and the exponential rise in trans-national economic partnerships, globalization has become the motivation behind the creation of links rather than restrictions. It refers to the idea of a world increasingly expanded, shrunk, connected, integrated, interdependent, or less territorially divided economically and culturally among nationals.

But the question now being asked in Europe, for instance, is whether the EU is still inclined to live in a borderless world? When Schengen was launched, the answer appeared to have been a yes. Today, however, as the EU and the UK move forward on Brexit talks and other nations wave flags of independence, is there a new answer to the question of borders: that Europeans do not want to live in a borderless world. So, today, debates do not only focus on the EU's external borders on issues of llegal immigration and migrancy, but on its internal ones as well.

Brexit is a good example of this and one of the chief border issues here is that of the Irish land frontier. UK Prime Minister, Theresa May has said post-Brexit there would be no hard border between Northern Ireland and the Republic of Ireland or one between the mainland UK and Northern Ireland - and after initial Brexit talks with the EU, she said she believed negotiators had secured an agreement on this.

The text of the deal says, however, that if there is no formal Brexit deal, the UK will ensure that "no regulatory barriers" will be created between Northern Ireland and the Republic of Ireland, leaving the door open for continued alignment with the single market.

But political watchers in the UK say the government is badly underprepared for new border controls if Britain leaves the EU without a free trade deal. Reports state the Public Accounts Committee (PAC) said the government's assumption that there would be a comprehensive free trade agreement was "reckless". Not preparing for a "hard Brexit" outcome put UK border security at risk.



In this regartd, there continues to be huge uncertainty about the UK's future relationship with the EU. The Irish government has demanded "regulatory alignment" between Northern Ireland and the Republic, meaning that new border controls would not be necessary. This debate continues as there was a failure to reach agreement between Britain and the EU after the Democratic Unionist Party objected, arguing that Northern Ireland must leave the EU on the same terms as the rest of the UK. If, as the government proposes, that means leaving the single market and the customs union, many trade experts believe that would mean border control points. This would furthermore impact on transport infrastructures and traffic. Reports already state the number of decisions required about people or goods crossing could more than treble and more than quadruple respectively.

Mexican wall

Meanwhile on the other side of the Atlantic, debate and argument continue over the Trump Administration's controversial plan to build a wall between the US and Mexico. Recently the White House has asked for $18 billion to fund the US-Mexico border wall, Donald Trump's signature campaign promise. If granted, the money would pay for 316 miles of new fencing and reinforce another 407 miles where barriers are already in place. The entire border stretches almost 2,000 miles, although much of it is already impassable.

According to reports, the request forms part of a $33 billion, 10-year package to tighten up homeland security with the remaining $15 billion going to fund "critical physical border security requirements" such as technology, personnel and roads. According to reports, the blueprint allocates $8.5 billion over seven years for 5,000 new Border Patrol agents and other officials; $5.7bn for towers, surveillance equipment and other technology; $1bn for road construction and maintenance.



In return for the cash, the Trump administration will be expected to discuss a way forward for the so-called dreamers - illegal immigrants who were brought to the US by their parents and know no other country. Under the Obama presidency, they were given protection from repatriation under the Deferred Action for Childhood Arrivals act, known as DACA. Donald Trump announced the end of that program in 2017 and has said he will not sign a fix granting 'amnesty' to DACA recipients without action to secure the border first.

During the presidential campaign, President Trump promised his base he would build a "big beautiful wall" and that "Mexico would pay for it." At the time, he estimated the construction would cost $10 billion and cover the entire 2,000-mile border. So far, according to reports, the Trump administration has struggled to secure funding to cover just 72 miles of priority areas along the border, which have been identified near San Diego and the Rio Grande Valley. As an aside, Mexico has steadfastly refused to contribute and the spending plan indicates American taxpayers would fund it for at least the foreseeable future.

The White House also announced it will end a program allowing Central American minors to apply for U.S. asylum while still living abroad. At the same time, the administration is exploring ways to scrap legal protections that limit how long and under what conditions children can be held in immigration detention centers.

In response to questions about the changes in immigration policy focused on children, the White House is reported to have said that relevant agencies were reviewing ways to help "law enforcement professionals to do their jobs and keep the country safe".

In addition, the administration says it wants to prevent children from undertaking perilous journeys to the United States and eliminate fraud and exploitation from programs for young immigrants.

Cyber borders

In the world of the internet and the invisible borders (or not) of cyberspace, digital threats have taken on an enormous value. Digital technologies are more and more an integral part of our daily lives. It is estimated that in 2025 there will be 80 billion devices connected to a surprising internet traffic of 3.3 Zettabytes per year. The quality of digital infrastructure and the ability to protect the cyber physical ecosystem into which modern society is transforming will in the foreseeable future be key factors in determining the level of economic prosperity and in attracting international investment.

According to some projections, the impact of the cybernetic threat in the next 5 years is estimated at US$8 billion and 5 billion information files will be stolen in 2020. Recently, European Commission President Jean-Claude Juncker, in his speech on the State of the Union, highlighted the relevance of the cyber threat, underlining the need for a pan-European approach to the creation of new instruments. This includes, in particular, a European Cyber Security Agency, with the aim of helping Member States defend themselves against hacking and attacks.



Industry watchers say in addition to cooperation between the various countries, a new model of public-private collaboration needs to be built to ensure innovation and at the same time provide the necessary security to enable and safeguard it. High-technology companies, and in particular those in the defense and security sectors, have a key role to play in supporting national capabilities.

Borderless Intelligence

There is also a borderless intelligence approach to combating cyber attacks, which incorporates all the requirements for going beyond the boundaries known to date, with a capability for continuous analysis, allowing you to respond to the ever-increasing attacks and threats which are more powerful every day. To face an extremely dynamic scenario, at the same time, industry innovators state a vision is required that transcends today's boundaries as well as offering increased efforts on prevention, cooperation and transparency in cyber incidents.

If digital security has focused so far on how to react to an attack, today the new frontier is represented by the development of cyber intelligence tools that are capable of anticipating moves by the enemy. One of these, the Intelligence Operation Centre (IOC), is specifically focused on open source information analysis, devoted to automating the collection and management information for police forces and government agencies.

In all cases, physical and digital, the world is seeing the creation of new borders, some bringing much-required security and peace of mind, but others arguably flying in the face of modern society's globalized approach to business, politics and economics.

by Victor March

Assessing Germany's energy transition initiative

Otto Schily, a leading advocate of sustainable development and Germany's former Minister of the Interior, shares his candid assessment of the advantages, failings and costs of Germany's energy transition program, ostensibly designed to curb the contribution to man-made climate change. As government and power companies attempt to tackle the issues surrounding cleaner energy, the ensuing debate surrounding which regenerative energy resources and their attendant technologies offer the best return on investment, is brisk

The reduction or removal of carbon dioxide from energy sources is seen by many as the most important goal to be reached in order to curb the progression of man-made climate change. It is called decarbonization and requests collective efforts to be made, starting from an overall rethinking of energy policies as they have been promoted and implemented over the last decades.

The European Union's leading power companies claim to have set themselves the goal of making their electricity carbon free by 2050, which, in theory, is considered as an achievable objective. A mix of renewables - such as wind and solar power, nuclear power stations and coal- and gas-fired plants that capture carbon dioxide emissions - could provide all the electricity we need with very little output of greenhouse gases.

But what is the right mix? What are the solutions that truly support the decarbonization goals and what experiences have proven to lead in the expected direction?

As governments need to orient the massive investments necessary to contrast man-made climate change, the time has come to assess if denuclearization experiences such as Germany's energy transition initiative should be considered best practices to refer to and expand upon.

We discussed this with Otto Schily, who was Federal Minister of the Interior of Germany in the cabinet of Chancellor Gerhard Schröder and a founding member of the Green Party.



How would you define a successful energy policy?

Mindfulness and caution are required in serious decisions. This is particularly advisable in energy policy issues if it is to be efficient. And efficiency is synonymous with success.

Energy policy can only be successful if it is possible to make energy generation, energy transmission and energy consumption as efficient as possible. In other words, energy systems are efficient when effort and expense are in proportion.

The yield of an energy supply system is well known to us: electricity, heat and transport. The definition of the effort becomes more difficult. Certainly this includes the costs of energy production and energy transfer. Naturally effort is expected , but land use and environmental impact have to be taken into account and this requires additional effort. In an expanded perspective, we can also calculate the risk burden for this effort (looking, for example, at security of supply or technical hazards) or, conversely, expect avoidance of risk or even of the environmental burdens which affect yield.

It is the great merit of the environmental movement that air pollution, drinking water contamination and soil pollution are now being included in the question of whether an energy supply system is efficient or not.

In order to avoid environmental pollution, today more and more regenerative energy resources are used worldwide. The EU has also

set itself the goal of significantly increasing the share of renewable energies in the electricity supply. Renewable energies, too, have to accept the question of whether they are really efficient and how they are linked to environmental pollution.

Considering efforts currently being made in Germany, how can the so-called 'energy transition' be assessed from this point of view?

The main content of the energy transition initiative is the expansion of renewable energies and the complete withdrawal from nuclear power. The proportion of energy produced from solar, wind and biomass is to be increased to between 40 and 45 percent by the year 2025 and 55 to 60 percent by 2035. Recently, under the definition of 'decarbonization', the generation of electricity from fossil fuels should also be avoided.

According to the Federal Government, the second pillar of the energy transition initiative is the reduction of energy consumption. However, in the face of high energy costs, there has been a long-standing effort at an industry level to reduce energy consumption both in production facilities and in consumer goods such as electrical appliances, heaters, vehicles, etc. However, the G20 countries, as well as the EU and its member states, want to reinforce these efforts through a series of measures. A critical discussion of these efforts is not my topic today. I will just say that final energy consumption in Germany has hardly fallen since the beginning of the 1990s. The power consumption has even increased.

My point is exclusively to shed light on whether the energy transition in the narrower sense - i.e. the conversion of power supply to the use of so-called regenerative energy resources stepping away from nuclear power and in the future also from fossil-fuelled power plants - is efficient or not. To be clear upfront: I say that from a financial and economic, ecological and even social perspective, today's energy transition program is a true disaster.

What are the costs of the energy transition program?

The energy transition initiative is sinfully expensive. Today, Germany has the highest electricity prices in Europe for businesses and, after Denmark, the second highest electricity prices in Europe for private households. The energy transition has led to billions in losses and large-scale capital destruction at large energy supply companies such as RWE, E.ON, EnBW and Vattenfall. All German investments in the solar industry turned out to be a flop. The major companies - Siemens, Bosch and Würth - bid farewell to the solar business with billions in losses. Many medium and smaller solar companies went bankrupt. In the wind energy sector too, the first signs of crisis are starting to following the first boom, which was supported and fueled by high subsidies.

The energy revolution contradicts all market-economy principles and thus leads to a systemic misallocation of financial resources. It is planned economy with a huge subsidy volume and immense bureaucracy. The losers are consumers and businesses. The winners are the subsidy profiteers who have managed to build a powerful lobby with the pretence that energy transition is supposedly a path to an environmentally friendly and sustainable energy policy.

The truth is, the financial expenses for the energy transition add up to horrifying amounts. Up to the year 2015, the total costs for the energy transition (both direct and indirect) have already reached around 150 billion euros, including the cumulative EEG apportionment totaling 124.8 billion euros. From 1.5 billion in 2001, the EEG levy has risen to more than 25 billion euros annually.

According to a recent expert opinion, by 2025 the total cost of the energy transition will increase to € 520.5 billion (nominal, including grid expansion costs), including the cumulative EEG-surcharge of € 407.1 billion. In a more forward-looking forecast, the former Berlin Senator for Finance, Ulrich Nussbaum, expects that the expenses due to the commitments entered into by 2030 on the frightening sum of 750 billion will increase. I leave it up to your imagination to calculate the enormous sums of money that will be spent on the energy transition - and if the 2050 goal will even be reached. In view of the numbers that are already known today, I can only think of Hamlet's comment: "Though this be madness, yet there is method."



Meet Otto Schily

Otto Georg Schily was Federal Minister of the Interior of Germany from 1998 to 2005, in the cabinet of Chancellor Gerhard Schröder. In 1980, he was a founding member of the Green Party, which he left 1989, joining the Social Democrats (SPD) instead. After serving as a minister, Otto Schily remained an advocate of policies and technologies for sustainable development. He became a supervisory board member of two companies for biometric technologies.

What about the environmental impact of this transition?

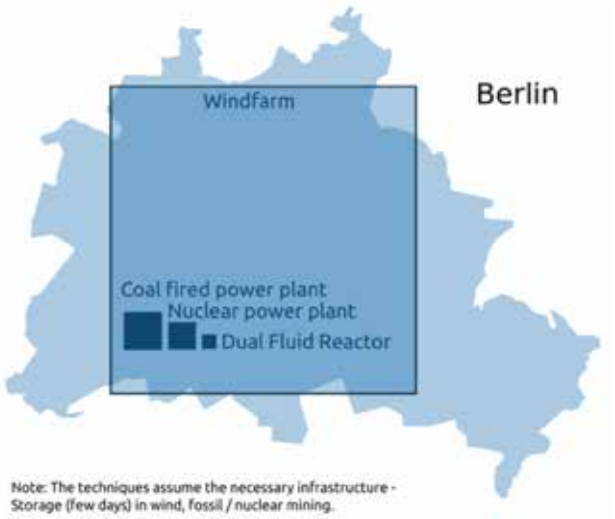


Diagram shows the comparative sizes of alternative electrical energy sources (1GW) in Berlin: a DFI plant (as big as a large shopping center) as opposed to a wind farm (almost as big as the city itself), a coal fired plant and its mines (a single district) and a nuclear plant (a few city blocks)

The energy transition is anything but environmentally friendly. The large-scale construction of wind turbines in Germany leads to the destruction of landscapes developed over centuries that became part of our cultural heritage, massive losses in the bird population, probably also damage to the micro-organisms and thus to the desolation of the soil, as well as damage to the health of people living in the neighborhood where the 'wind monsters' must live. Power generation with wind turbines is associated with enormous space consumption. In order to meet the electricity needs of Berlin, an area as big as almost all Berlin will be equipped with wind-turbines.

Nonetheless, the apologists and profiteers of the energy transition want to continue the expansion of wind energy in Germany. But tripling the current wind power capacity from 51 GW to a full 155 GW would not even cover half of Germany's electricity demand. But it would mean setting up a 200 meter high wind turbine on average every 2.7 km - across the country without regard to the landscape, lakes, mountains, cities. The energy transition makes no significant contribution to reducing CO^2 emissions. (Germany has a 15 times higher CO^2 emissions compared to France.) The fact that the production of solar cells and wind turbines is associated with environmental pollution is mentioned only in passing.

In connection with the energy transition and climate change, the battery-powered electric car has recently been touted in Germany as a supposedly environmentally friendly solution for car traffic. Regardless of the euphoria surrounding battery-powered electric cars, we should not underestimate the environmental problems associated with mass conversion from the combustion engine to this technology. Part of the energy transition concept is also the subsidization of the cultivation of plants for the production of biogas and biofuels, which has led to huge areas of monocultures. This results in a dramatic reduction of the 26 most important songbird species in Germany, an ecological catastrophe. Alarming reports of a 75 percent reduction in the insect population in Germany also appeared in those days. Also in this regard, we can assume a connection between the agricultural monocultures and the destruction of landscapes by wind turbines.

Is there also a social impact worth mentioning?

In addition to what has already been said, the energy transition is also a misconstruction from a social point of view. It leads to a huge redistribution from bottom to top. The pensioner in Bochum and the skilled worker in a coal-fired power plant pay the subsidy that the profiteers of the energy transition receive, the lawyer in Starnberg for his solar roof and the owner of an otherwise worthless property, which builds there a wind turbine. For the skilled worker, this compulsory levy is particularly bitter, because it even finances the competitive business, which wants to take away his job in the end. And is it just a trivial fact that in wealthy Germany, 330 000 households were turned off and 6.6 million households are threatened with closure because they could not pay their expensive electricity bill?

What is your overall assessment and prediction?

The change in the power supply structure caused by the energy transition is neither sustainable nor competitive By shifting electricity production to wind turbines and photovoltaics, the power supply is becoming more and more unstable and unreliable. Because of the weather, the 'fluttering' of wind turbines and solar cells always ends in the 'dark lulls' for short or long periods of time. A power grid that relies only on the supply of wind and solar power cannot be kept stable. The assertion made by some energy transition profiteers that wind energy can provide the control energy required to stabilize the grid is, at best, wishful thinking. Even today, the so-called 'redispatch' measures, which have increased dramatically due to the strong share of wind and solar in electricity production, are causing billions in costs. Not infrequently, too much wind power is produced. Then electricity has to be exported at 'negative prices'.

But is it worth the exorbitant effort for the energy transition, because we have rid ourselves of the supposedly intolerable risks from the operation of nuclear power plants? On closer inspection, this proves to be pure illusion. If you do not close your eyes to reality, you have to realize that by shutting down your nuclear power plants, you assume an intolerable risk. Germany has not become safer, because France will continue to operate nuclear power plants in large numbers as will the UK, while new nuclear power plants are being built in Poland, Finland and Russia.

Thinking bans and the tabooing of nuclear technology block the way to an efficient energy policy. The most important and quite serious objections to the operation of nuclear power plants are known to be the following:

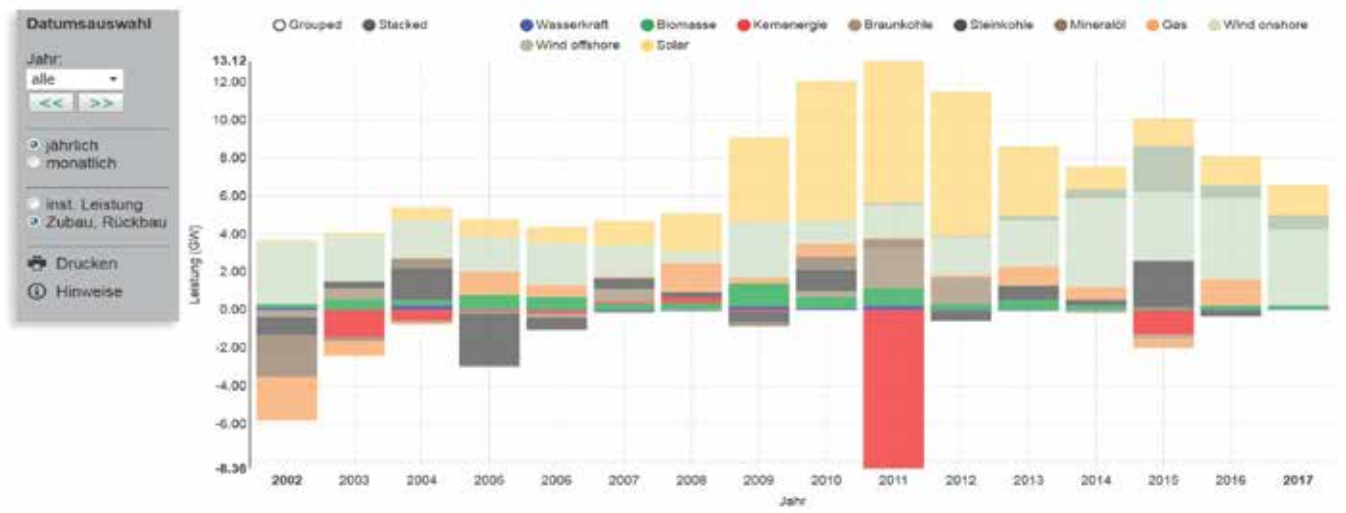
- nuclear technology is ultimately unmanageable, because it can lead to a meltdown as in Chernobyl and Fukushima with incalculable consequences for people and the environment;
- nuclear waste must be stored with high costs and risks over unmanageable periods, and a reliable solution for final disposal does not exist today.

Is technology innovation paving the way to a revival of nuclear energy?

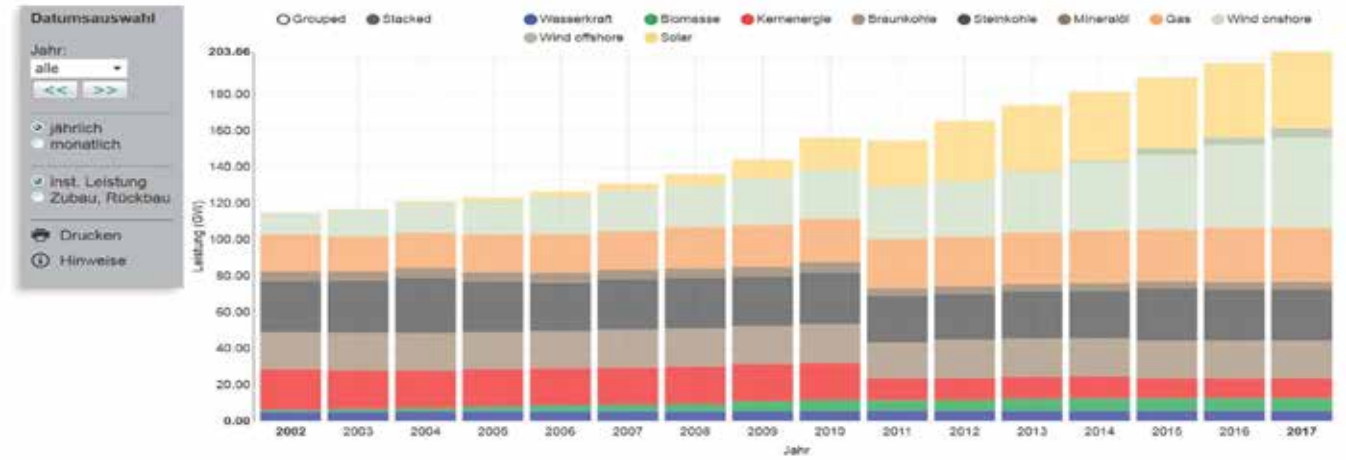
An important fact that is not truly promoted to public opinion is that the technology for nuclear power plants has not stopped developing. Meanwhile, there are modern reactor models (Generation IV), that are inherently safe, where a nuclear meltdown cannot occur for physical reasons, and that can minimize nuclear waste to such an extent that a repository is no longer required.

The suitability of these new reactor concepts will undoubtedly be assessed under the efficiency principle. However, for the assessment of whether or not a specific form of energy generation - more specifically, a particular form of energy conversion - is efficient, a criterion that I have not yet addressed should be the main one: the so-called EROI factor (energy return on invested energy) or crop factor. The EROI factor compares the total energy that a power plant produces during its lifetime with the total energy invested, their ratio being the harvest factor. However, the actual calculation of the harvest factor is not easy. You have to understand the whole lifecycle of an energy generating plant, from cradle to grave, so to speak. In the end, however, you will get a complete balance sheet, including the extraction of fuel, if necessary, as well as the disposal of all waste.

A life cycle analysis is thus always a holistic environmental balance. And efficiency is once again environmental protection. It turns out that what appears to be environmentally friendly and sustainable at first glance provides a completely different picture after a precise life-cycle analysis. This applies, for example, to wind turbines. Apparently, the wind resource is used for free, but a detailed



Reduction of power generation capacity of the nuclear power plants had to be compensated by the addition of coal power plants



Installed net power for power generation from 'conventional power plants' has remained almost the same, but with a reduced proportion of nuclear power and increased proportion of gas

analysis proves that the balance sheet is by no means positive. Wind and sun are just not free, because if you want to produce electricity with it, cement must be fired and concrete must be poured, metal needs to be produced and processed, forests must be cleared and land must be subtracted from Nature.

The conventional type of nuclear power plant featuring a large pressurized water reactor has the best yield factor. But what about the new reactor models of the already mentioned generation IV? In the models of this type, the gain in security (no meltdown possible) leads to increased costs, making commercial use uneconomic. However, a notable exception to this is a further development of the Generation IV reactor concepts - the Dual Fluid Reactor from the Berlin Institute of Solid State Nuclear Physics. This reactor is inherently safe, a meltdown cannot occur for physical reasons. The special feature of the DFR is that it separates the fuel circuit and the cooling circuit. Hence the name 'Dual Fluid'. It has the ability to destroy radioactive waste in short periods of time. The remaining waste is only fission products whose radiotoxicity subsides within 300 years. A repository is not required.

The DFR combines the advantages of the liquid salt reactor and the metal-cooled reactors (sodium-cooled reactor, lead-cooled reactor), and it achieves sustainability, safety and profitability goals. Unlike conventional light water reactors, the DFR, as a breeder reactor, can utilize not only uranium-235 (0.7% of natural uranium), but also uranium-238 and thorium, so that resources could last for millions of years. It can even use the nuclear material from spent fuel elements of conventional nuclear power plants energetically and gain power from it on highly competitive terms. In addition, the DFR can be perfectly tailored to cooperation with renewable energy sources. The DFR is very flexible, it can reduce energy consumption to 7 percent and compensate for the volatility of renewable energies.

So why is nuclear energy being tabooed?

We should indeed debate without prejudice whether it is meaningful to include modern nuclear technology in our energy mix. Writer, Joseph Conrad gets it: "What saves us is efficiency - the devotion to efficiency". This should be the leitmotif for an economically sound, sustainable and environmentally friendly energy policy, and at the same time arouse the interest of brave and far-sighted entrepreneurs to invest in DFR.

by Sophie B. de la Giroday

Debating the case for lawful access to data

Legalities surrounding frontiers and sovereignty in cyberspace could directly affect European data protection and may have a major impact on cooperation between the U.S. and the EU on issues of law enforcement and counter-terrorism cooperation. Michael Chertoff looks at the potential consequences and ways through them



Concerns surrounding a perceived disconnect between American and European approaches to cross-border exchange of data for law enforcement and counterterrorism purposes, see issues of data privacy and security on the rise. Data flows between Europe and the US are seen to show how much Europe depends on the transatlantic relationship when it comes to digital. This is the case on both technological and economic levels. Michael Chertoff, former Secretary of the U.S. Department of Homeland Security suggests ways forward for European-US engagement, in light of a pending case between the Microsoft and the US government over the validity of a mandate issued by a US judge on content data hosted by Microsoft in Ireland. The crux of the matter is whether a US judge can, without going through the dedicated international cooperation processes, request data hosted on server located abroad.

What is the background to this issue?

We have been warning for some time about the potential adverse consequences from trends toward 'balkanization' of the Internet. Our hope has been - and remains - that enhanced cooperation between the U.S. and Europe can be fostered through greater understanding of the potential risks associated with the current path of policy development. The question is quite simple but the stakes are many, because each party tries asserting their own interests. For States, this is about ensuring their own safety by providing judicial authorities an easy access to digital data wherever located. In this regard, it is quite clear that existing arrangements based on MLATs - mutual legal assistance treaties - do not meet the exponential growth in requests for international mutual assistance on digital data, nor the necessary responsiveness required in the cyberspace.

For businesses, be they users or cloud op-

erators, it is about ensuring they have a powerful and cost-effective "IT energy" available to cope with digital transformation. This implies "massifying" their activities around a handful of large data centers, and avoiding conflicts of laws and jurisdictions. For both, it is also a question of maintaining and strengthening citizens-users' trust in the protection of their personal data, which is essential for the development of new uses.

What does the Microsoft case entail?

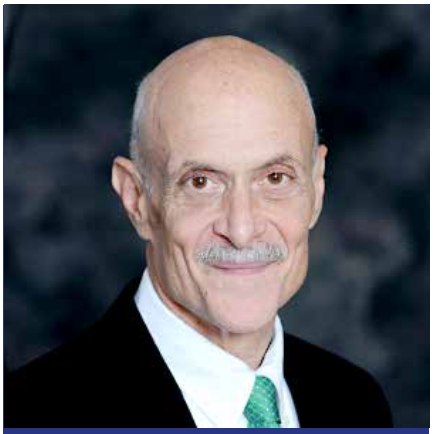
The U.S. Supreme Court has agreed to take up a case that may directly impact U.S.-E.U. data sharing activities - Microsoft v. United States with a final decision set to be released at the end of June 2018. Broadly speaking, the case relates to a warrant issued by the U.S. government to Microsoft which, if enforced, would require Microsoft to repatriate content data held in an Irish data center to America for provision to law enforcement authorities. At issue is a simple legal question: May U.S. law enforcement authorities compel Microsoft to produce in the U.S. data held in an overseas data center? More prosaically: Does American law control data stored in Europe? The resolution of that question is, or ought to be, of profound importance to Europeans. Data sharing between the U.S. and E.U. is vital to both government and industry, for both law enforcement investigations and for all types of commerce. And, given the nature of cloud architecture, data storage and transfer is now a global issue-physical borders are not determinative.

The decision of the US Supreme Court will therefore carry a world of meaning. If the Department of Justice is proved right, US judges will ipso facto be given some kind of global jurisdiction: during a domestic process, they will be entitled to request content data - rather than merely connection data - to any operator on the planet. And without even claiming to an extraterritorial application of the law, since the DoJ regards that data as coming under US law as soon as they can be consulted from the US territory.

This can be seen as a sleight of hand that potentially "territorializes" much of the world's data in the US, since data stored in the "cloud" is by definition accessible from any place on earth. This would result in repeated infringements on the sovereignty of concerned States, in an incompatibility with European data protection agreements and legislation (and in particular the European Regulation on the Protection of Personal Data ...), and in permanent legal uncertainty for digital operators who will be facing a dilemma. All the more, other countries could also be tempted by unilateralism and could stop using existing international law tools. The consequence would be a proliferation of conflicts over sovereignty and the exacerbation of digital protectionism, a situation with no winners.

What level of impact could an affirmative decision have?

A decision affirming the government's authority to issue such a demand would commit the U.S. to the position that its demands for the production of evidence can be given extraterritorial effect. That, in turn, will have significant impact on U.S.-European cooperation. The globalized nature of the Internet has had an especially profound impact on law enforcement. Investigations of local crimes that were once restricted to the narrow geographic area where the offense occurred have now, routinely, been transformed into cases where evidence gathering requests involve data that may be stored almost anywhere in the world. The content of communications relating to an offense, and the meta-data associated with that content, may be stored in multiple locations and in some cases, move among data centers for any number of reasons, both technical and practical. Because data is no longer localized, law enforcement must often, in effect, cross national boundaries to investigate even the most routine of cases. In the U.S. and in Europe the processes for these cross-border law enforcement efforts often are grounded in outdated laws and policies.



Meet Michael Chertoff

Michael Chertoff is the Executive Chairman and co-founder of The Chertoff Group. From 2005 to 2009, as Secretary of the U.S. Department of Homeland Security, he led the federal government's efforts to protect the nation from a wide range of security threats, including blocking would-be terrorists from crossing US borders or implementing their plans if they were already in the country.

The Mutual Legal Assistance Treaty (MLAT) process for transnational criminal cooperation is both cumbersome and fraught with legal uncertainty. Requests made through the MLAT process often take months, and in some cases years, making it a source of frustration for law enforcement authorities on both sides of the Atlantic.3 As a result, under the understandable pressure to deal quickly and effectively with criminality, law enforcement in America has turned, systematically, to the much more rapid process of issuing domestic warrants - but with the resulting challenge that they are, in effect, demanding that American companies give extraterritorial, overseas effect to American law enforcement demands. This practice raises the fundamental issue of sovereignty and leads to conflicts of law and questions of international comity.

More generally, what are consequences of so-called unilateral solutions?

In an era of heightened cyber-criminal activity and election interference, trans-Atlantic cooperation on cyber-crime and cyber-at-



Trans-Atlantic cooperation on cyber-crime and cyber-attack is more critical than ever

tacks is more important than ever. Yet without broader legislative action and/or international agreement, a decision in favor of the government in the Microsoft case will likely have the perverse effect of making trans-Atlantic cooperation more difficult for law enforcement, government, and businesses. The extraterritorial application of law will, in our judgment, negatively impact cooperative efforts between the U.S. and other countries and trench upon their sovereignty. To see why this prospect is so fundamentally disruptive and daunting, it is useful to indulge in a thought experiment - what will law enforcement data sharing look like if the U.S. government's view on extraterritoriality prevails? The picture is not a pretty one and we can already see the outlines of it taking shape in the actions of various nations.

Looking into potential impacts, we see several areas in which international cooperation between the U.S. and Europe is nearly certain to suffer. These impacts are likely to include:

- reciprocal extraterritorial application of the domestic law of other nations to assert the right to access data held within servers under American jurisdiction, creating conflicting and incompatible legal obligations for providers;
- expanded, and what could be described as greatly enhanced, data localization requirements in non-American countries designed to prevent U.S. law enforcement from accessing data relating to their citizens;
- perhaps most troubling, likely adjustments to Privacy Shield or, even, the elimination of mechanisms that allow for companies to transfer data across the Atlantic. Surely these prospects are appealing to no one.

What about data localization - would it become more restrictive?

If there is a pro-U.S. government result in Microsoft, trends toward data localization will almost certainly accelerate, likely to the point of what one could term "extremely restrictive data localization." European countries, in particular, are likely to pursue data localization requirements to prevent perceived harm to their citizens. This is, also, an understandable impulse - an enhanced version of data localization is one of the only ways to ensure that a country's law applies to the data of their own citizens by requiring it to be held domestically by a provider who will comply with local law. This would be a step beyond existing data localization regimes, which are generally limited to a requirement that data on local citizens be physically stored within a country's borders without regard to where else the provider operates. If the Supreme Court were to accept the government's argument, U.S. authorities would be able to compel any service provider with a presence in the U.S. to turnover data regardless of where it is stored, which would render existing data localization requirements inadequate. In response, countries would be incentivized to create far more restrictive data localization requirements that require the provider to only operate within the domestic jurisdiction in question, thereby preventing authorities in other countries, such as the U.S., from using the provider's presence in their country as grounds to compel them to turn over data under an extraterritorial application of their own laws.

But this sort of highly restrictive data localization, however, understandable, is a second-best solution. For one thing, it is effectively cyber protectionism - privileging local providers over global ones in a way that ultimately disserves the domestic consumer. More importantly, it would result in the creation of an extremely balkanized internet in which providers operate within a single country and are obliged to avoid cross-border activities in order to avoid extraterritorial application of domestic laws. The global internet would become more of an idea than a reality. Whichever answer one prefers, it is simply an untenable argument to suggest that sovereign disagreements on policy should be resolved at the price of reducing the internet to loose patch work of local internets designed to ensure compliance with local law.

What other collateral effects do you envisage?

In a post-Microsoft world, we will likely see collateral effects in the commercial sector. If European authorities do not believe that they can trust U.S. law to respect E.U. law, then, generically, they will be more reluctant to permit European personal data to be transferred to the U.S. This is a necessary corollary of the trend towards extreme data localization that will likely lead the E.U. to seek adjustments of Privacy Shield and other mechanisms that allow for the transfer of the personal data of E.U. citizens to America.

For good reason, we anticipate that post-Microsoft (if the U.S. government prevails) the E.U. will perceive privacy guarantees offered through Privacy Shield, Binding Corporate Clauses, or other mechanisms to be unenforceable against government action and thus of less value. Further, such a decision by the Court will probably be seen as a clear indication that the U.S. doesn't value foreign laws or personal privacy to the same degree as Europeans.

An adverse Microsoft decision may also influence the European Court of Justice as it continues its consideration of challenges to Privacy Shield. In the end, cancellation of Privacy Shield would be disruptive to businesses in the U.S. and E.U.-if these mechanisms are eliminated or significantly modified it would be effectively impossible for companies to move data between the two jurisdictions. This would, manifestly, have a significant economic impact, making it deeply

problematic for many businesses to operate in both jurisdictions in a unified manner.

What is your proposal for engagement?

Americans and Europeans should be seeking out opportunities to collaborate on lawful access and build a system that both respects sovereignty concerns and enables effective enforcement while protecting citizen privacy. Though ambitious, the goal is not impossible to achieve. The U.S. and Europe should be able to reach consensus, through international diplomacy and agreement, on how law enforcement gains access to data stored abroad-our values are fundamentally the same. Indeed, agreement between the U.S. and European countries is critical if we hope to build international norms that align with our values-such an agreement can help lead the way for other countries and form a broad basis for global consensus.

How would agreement be achieved especially if the Microsoft decision may disrupt any efforts?

To begin with, Europeans should consider the implications of the Microsoft case and determine their interests in the broader issues. Now is the time for Europe to engage on these issues and make their voices heard within this debate - later may be too late. The Supreme Court is unlikely to understand the global implications of its decision if those are not brought to its attention by competent authorities who understand the problem. In addition to explaining, clearly, what the potentially adverse consequences would be, Europeans should also, in our view, be open in their commitment to a dialogue with the U.S. government. In the midst of legal ferment, the Court should consider the possibility of a way forward to achieving a trans-Atlantic consensus on what the legal framework and solutions to these issues should look like. In other words, the Court should be aware: a) that decisions about trans-Atlantic law enforcement cooperation should be made jointly and not by a single U.S. court; and b) that the prospects for a potential solution is realistic, and not just a pipe dream.

Happily, there are a number of areas of progress that can be pointed to as reasons for optimism that a mutually acceptable solution is in the offing. Indeed, the U.S. Congress continues to debate a variety of potential solutions. Various other organizations and companies are working on ways to address at least some of the problem. For example, in the U.S. Congress, active consideration is being given to the bipartisan proposal to enact the International Communications Privacy Act - a proposal that would, in effect, end American unilateralism in return for reciprocal commitments from our allies. Congress and the Executive Branch are also considering the first-of-its kind bilateral agreement between the U.S. and the United Kingdom.

This proposal amounts to a mutual recognition of the adequacy of each other's legal process, directly addressing potential conflicts of law while ensuring the preservation of sovereignty for both countries. This agreement is seen as a potential model for additional bilateral agreements between the U.S. and European countries. Meanwhile, civil society groups in the U.S. and the E.U. are engaged in extended efforts to articulate broadly agreed upon norms of behavior that could be generalized into an agreement of lawful access and data sharing. While none of these efforts has yet to reach fruition, each holds promise.

More to the point, each has the advantage of being derived from a broadly representative base that reflects the views of all stakeholders. While we have no crystal ball to predict how these efforts will eventually resolve, we are confident in predicting that each and every one of them has a better chance of leading to a stable, non-unilateral, global system of data exchange than would the exercise of U.S. legal imperialism by the Supreme Court.

What are your recommended next steps in the interim period before a decision is reached?

In the end, the core concept that must undergird our joint efforts is trust. Extraterritorial application of domestic law, data localization requirements, and protectionist practices undermine trust. So, to, would a unilateral expression of law by the U.S. Supreme Court. Countries need to retreat from autonomous action on these issues and work to build that trust. A first step - a vital step - in that process is for our European colleagues to share their views on these issues with their counterparts in the United States.

The U.S. legal process badly needs to hear the European perspective as it considers the issues before it in Microsoft. It may not be sufficient to persuade the Court, but left unexpressed it will surely have no influence at all. Solutions will be difficult, but many are already working to find them. Finding them depends on international cooperation and trust-trust that would be undermined by a Supreme Court decision in favor of the U.S. government position. We urge Europeans to consider the long-term impacts of their actions when addressing these issues today-unilateral, short-term fixes are damaging the chances of identifying more effective, long-term solutions. Now is the time for the U.S. and Europe to engage in a meaningful dialogue that addresses these vital issues, working toward an international agreement rather than unilateral solutions.

U.S. Supreme Court has taken up a case involving Microsoft and U.S.-E.U. data sharing activities



Challenging controls in finance

How can data intelligence and AI be harnessed to ensure full transparency in fund management, especially in developing countries? What are inter-governmental organizations (IGOs) such as the United Nations doing to help control funds? UN adviser, Richard Kerby, expands on issues of efficiency and accountability

As the world of finance moves rapidly towards artificial intelligence developing algorithms for faster trading and speculation - often in the banks' interest - there is a call for similarly powerful instruments to be made available to estate owners, including governments, to look at transactional data and assess what is happening. This includes knowledge on what is being declared about their assets and what real risks are being faced in terms of the management of government funds, large treasuries and donors' funds, including major intergovernmental organizations (IGOs) such as the United Nations. In addition, it has been mooted recently by industry thinktank, the Finance Transparency Forum (FTF), that data received from the financial operators is not yet challenged or validated as systematically and effectively as necessary. In addition, FTF members say there is a lack of technology-empowered control on information provided by banks and asset managers to investors, as technology developed in the finance sector (including fintech) works mainly for the finance industry itself or is feeding on data generated by the finance industry. Richard Kerby is Senior Interregional Adviser on e-Government and knowledge management with the United Nations Department of Economic and Social Affairs and board member of the Finance Transparency Forum. He expands on the need for transparency and control in this particular area in developing countries and the UN's commitment to efficiency, effectiveness, accountability and transparency in the management of such funds.



In terms of control, transparency and security, how is the world of finance evolving, in the era of big data and artificial intelligence?

Technology today, whether it is blockchain, cloud, fintech, social media, metrics, etc. allow a massive information dump on both individuals, corporations, associations, international organization and multinational organizations that was simply not available in the past. Security has become more rigid than previously, which allows for a freer flow of financial transactions that can be easily audited. But it also allows fraud to be potentially more damaging. In the past, a handful of credit card accounts could be stolen. Today, that number is easily in the millions of potential fake accounts. Thus, technology needs to continuously improve and become more secure to ensure that one's individual data is protected and that only him/her has access to this information. As we use more biometrics and blockchain technology to secure data, this should mitigate the potential fraud in the financial market.

How are recent global trends in e-Government that bridge the digital divide in terms of delivery of services, data and content, particularly in the developing world, affecting the new financial ecosystems that are being created as a result?

Inter-linkages between government, transparency and sustainable development efforts are becoming more critical. Development of the intelligent society can strengthen national capabilities, support networks and provide stronger voice of citizens in negotiations and policy-making. Open data and vendor-neutral independent analytical power applied to monitor financial ecosystems in the interest of taxpayers are integral to its development.

In this regard, partnership with data entrepreneurs and the private sector will help support change programs and advance e-government development. Digitization should be seen as a holistic process entailing not only the design and implementation of innovative practices, but more fundamentally a transformation of governments' roles, functions, institutional frameworks and processes. Governments need to become catalysts for change instead of mere service providers.

Historically, as Chairman of the Stichting Board of the African Training Management project which oversaw the distribution of donor funds over $35 million, how transparent was the use of donor and government funds then as opposed to today's technologically enhanced solutions?

This was a UNDP-World Bank Project whose objective was to place highly effective managers in African companies to strengthen their respective growth and performance. The Stichting Board, which was a Dutch vehicle essentially to mobilize funds for development donors, which would be then used to subsidize the salaries of these highly effective managers. The project ended at least ten years ago and has spun off into the African Management Service Company (AMSCO), which is still going on today. The head office is based in South Africa and their statutory office is still in the Netherlands. Since it was a UNDP-World Bank project, their respective financial regulations had to be followed.

In today's terms, I would say that the project would have greatly benefitted from the financial technology applications that are currently available in the market. The use of artificial intelligence and big data in decision-making situations would have made it easier to select the right companies to support. We had limited information to identify companies and the majority of the decisions were made from the inputs of the regional managers, who were not equipped with the necessary data and technology available today.

As a result, their decisions were based on annual reports and their gut feelings. The same lack of information existed in the search to identify the right managers to run the African companies, . We did not have the ability to even do a simple Google search or look into their LinkedIn site to verify their experience and the feedback that they received from their peers.

Given this experience and your involvement with other development projects in Africa's Private Sector and Information and Communication Technologies sectors, how have practices evolved in terms of the UNDP's commitment to efficiency, effectiveness, accountability and transparency.

The UNDP has a long-standing commitment to transparency, with country offices publishing financial, procurement and program information on respective websites on an annual basis. For example Open.undp.org, UNDP's online portal allows open, comprehensive public access to data on more than 10,000 UNDP projects, and publishes over US$5.8 billion in project data.

In 2014, the Publish What You Fund's Aid Transparency Index recognized this accomplishment, along with our corporate efforts toward enhancing transparency by ranking UNDP first overall out of 68 major institutions evaluated worldwide. In 2016, UNDP was ranked first again, topping the list for the second consecutive year.

Accountability in outreach projects, such as agricultural development, is critical



Meet Richard Kerby



Richard Kerby is Senior Interregional Adviser on e-Government and knowledge management with the UN Department of Economic and Social Affairs. He provides policy advice and carries out technical cooperation missions to Governments on issues connected with e-government development, focusing on open government, open data, e-participation, engagement, benchmarking and measuring progress. He is also an advisry board member of the Finance Transparency Forum.

How does this translate in terms of aid effectiveness particularly when the control and management needs of collaborative initiatives and outreach projects need to be embraced?

Performance effectiveness, accountability and transparency are critical ingredients to trusted development partnerships. UNDP has made itself readily available to outside scrutiny through the assessment tools of its partner constituencies.

A member of the International Aid Transparency Initiative (IATI) since its creation in 2008, UNDP has led outreach efforts with partner countries and UN agencies to champion the new aid transparency standard and make it relevant for national development planning, public financial management, mutual accountability and other processes at country level. More than 100 UN agencies, multilateral banks, bilateral donors and NGOs providing 76 percent of aid publish data in line with IATI guidelines.

In addition, institutional effectiveness has been central to the transformation that UNDP envisions in its 2014-2017 Strategic Plan. As a result, a new integrated results and resources framework is introducing more effective monitoring of how all UNDP offices achieve results and spend resources. To uphold quality assurance and foster organization-wide consistency, it includes core indicators and measurement guidance. UNDP's first integrated budget has simplified and made more transparent the management of its different revenue streams.

Smartly securing blockchain technology

As blockchain technology continues to evolve, secure element and smart card technology is playing a critical role in securing blockchain transactions in certain use cases, including crypto-currencies and vaults, funds transfer, asset tracking, and the Internet of Things

As Blockchain technology is widely viewed as revolutionary due to the ingenious way it solves for a transparent, distributed consensus network that is resistant to manipulation or takeover by a central authority. As a result, FinTech start-ups, financial institutions, and technology companies have invested in blockchain at an unprecedented rate-more than $1 billion since 2009-and this investment is still accelerating dramatically. Blockchain has been dubbed by industry analysts the fastest development software market in history. New blockchain applications are still emerging, and use beyond digital currencies is still being defined. Blockchain implementation for financial services applications is expected to be a significant area of growth. Financial institutions are expected to spend more than $1 billion in 2017 on blockchain applications50 and increasing numbers of large banks around the world are experimenting with blockchains and bitcoins.

Blockchain's crucial innovation is a decentralized ledger, secured with cryptography, that ensures integrity, immutability, and no single point of vulnerability in the network. However, one remaining area of vulnerability is the private keys associated with ownership. If those private keys are lost or stolen, any associated coins or assets are lost forever. Many people have inadvertently erased their private bitcoin keys, and the associated bitcoins have essentially disappeared. In other cases, thieves have hacked into centralized exchanges, stolen private keys, and irretrievably transferred the assets.

The concept of bitcoins, or electronic cash, was born from the idea that an ownerless, open-source, transparent, and decentralized



currency backed by cryptography could represent a dramatic improvement over government-backed currencies. The idea was pioneered by a group of mathematically minded individuals who were concerned about loss of privacy and institutional overreach by banks and governments.

Designing such a digital cash system faced several technical challenges. One is the double-spending problem: unlike physical token money, electronic files can be duplicated, and hence the act of spending a digital coin does not remove its data from the ownership of the original holder. Most experimental currencies solved this by relying on a central authority, which represented a single point of vulnerability and the potential for abuse. Removing this central authority and relying on a pure decentralized network then poses the problem of Sybil attacks, where one entity tries to gain a disproportionately large influence on the network.

Bitcoins

Bitcoin payment technology relies on a more general technology called blockchain technology. It implements a ledger, used to record the ownership of each bitcoin. This ledger is shared among all computers on the Bitcoin payment network, and each transaction is validated using a cryptographic puzzle. The puzzle is a computationally intensive hash algorithm.

The first computer to solve the puzzle, verifying and approving the transaction, is paid with newly created bitcoins (the individual running the computer is called a miner; the process is referred to as mining). Then, if a majority of the other computers on the network agree with the solution, the transaction is entered on the blockchain. The network is referred to as a consensus network, and it enables a new payment system and a new form of digital money, also known as cryptocurrency.

The Bitcoin network has far more computing power than the 500 fastest supercomputers in the world. It constitutes a crowd-owned, public, transparent, and safe transaction system, impervious to attack. It represents the first decentralized, user-driven, peer-to-peer payment network functioning without a central authority. Each transaction is identified by a unique number. Once the transaction is entered into the ledger, the bitcoin that was spent in the transaction cannot be used again. A slightly decreasing number of new bitcoins are generated daily, leveling off in 2140 at 21 million.

Although the bitcoin payment network has been subject to speculation, association with criminal activity, and hacking, the technology is still evolving. Average daily transaction volume for bitcoins has already surpassed that of Western Union, although Visa transaction volume is still 60 times larger.

Basic principles

Blockchain technology relies on the following basic principles:

1. decentralization - there is no central authority, with no single point of vulnerability or failure;
2. trustlessness - blockchain does not require trust in any authority or any participant;
3. consensus network - process allows participants to come to an agreement over what is true or false. For a cryptocurrency, it would typically concern the validity of a transaction;
4. transaction transparency - the validity of all transactions is available to everyone on the network;
5. transaction immutability - once added to the blockchain, a transaction cannot be changed or manipulated;
6. pseudonymous - transactions are anonymous (in that they do not require personal information) but can be traced back to a public key.

Smart card technology

Many use cases and applications are now being developed that use blockchain technology. All implementations of blockchain-based applications have the common security requirements of generating, storing and managing the user's cryptographic keys and would benefit from convenient user access and use of their keys. The smart card chip or embedded secure element contains a secure microprocessor, RAM, nonvolatile memory, and (typically) a crypto-coprocessor. The memory and processors are protected physically, using a variety of software and hardware security technologies. Implementing blockchain applications using smart card and secure element technology brings benefits.

It generates and protects user cryptographic keys. Smart card and secure element technology is purpose-built to perform key pair generation and other cryptographic operations quickly, with low power consumption. Because a hardware-based secure element is used, key pair generation is performed securely and is efficiently protected, even from advanced attacks. Smart card and secure element technology protects private keys in hardware with tamper-resistant hardware security and interaction restricted to a limited set of commands and responses. It provides straightforward user access to cryptographic keys. Smart card and secure element technology enables multiple form factors (e.g., card, USB devices, mobile device secure element, microSD, embedded secure element chip, wearables). This provides convenient, portable, user-controlled access to the keys used for blockchain transactions. The technology also provides blockchain application implementers with a standards-based security platform and established standardized security evaluation and certification programs (e.g., Common Criteria).

Blockchain applications

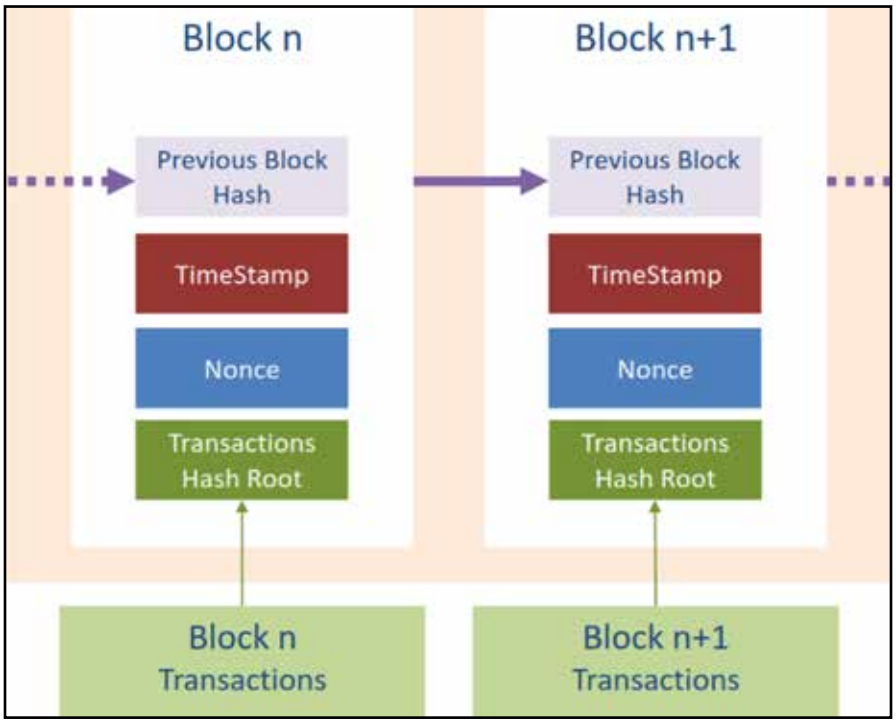
Financial services expected to use blockchain are: real-time settlement; money transfer; and smart contracts. Since blockchain applications may include the ability to execute contracts and make transactions, they must be secure: secret keys are used and need to be secured. Secure element technology, available in different form factors, can be used to generate, secure and manage these secret keys. Real-world examples include:

- Plutus uses NFC to "tap and pay" with bitcoin at any POS that accepts fiat currency;
- several bitcoin debit cards perform transactions using EMV contact or contactless technology, including BitPlastic, Coinkite, and Cryptopay;
- several implementations use hardware-based vaults to secure private keys.

As blockchain technology continues to evolve, the Secure Technology Alliance envisions a future in which smart card technology, in partnership with blockchain technology, can enable straight-through transactions with dramatic improvements in safety, security, and integrity.

by Secure Technology Alliance

Figure 1 - Creation of a Block



Evaluating past and future trends in national IDs

Looking at some of the incremental technological developments in national IDs. Are they serving as a foundation for a much smarter citizen ID future?

Over the past ten years there has been a sea-change in what citizens and governments expect national ID cards to deliver. Five topics have moved to the main stage over this period. These are biometrics, electronic national ID cards, mobile IDs, virtual documents such as the mobile driver's license and the need to set up a national identity framework

Fast forward to 2018 and digital identity technologies such as smart cards and biometrics have come of age, with an estimated 120 countries now deploying electronic passports incorporating these highly secure features and over 60 countries implementing eID cards. National ID cards have undergone a huge transformation; simple paper documents designed for single identification applications have given way to smarter documents in the form of a credit-card. These citizen ID cards or eIDs include a microprocessor for stronger document verification but also on-line authentication and signature.

As they contain the portrait of the card holder and very often fingerprints, they can be used for biometric identification and biometric authentication when needed. This new generation of national identity card offers one of the best identity theft protection.

These eID cards also enable governments to implement on-line applications such as eGovernment solutions giving citizens access to public services with the reassurance of robust security. The development of these government issued IDs means a single card can offer a host of applications - from acting as a driver's license, enabling the user to file their taxes or giving him/her access to state benefits.



Wide deployment

While some nations have been reticent in adopting eIDs, other countries have been far more bullish. There have been implementations in Asia with China, Malaysia and Indonesia to name a few, or across Africa with countries like the Republic of South Africa, Nigeria and more recently in 2016 with Algeria.

Added to that are deployments across large parts of Europe, in the Gulf and in parts of Latin America. All provide interesting examples of the potential of eIDs to affect millions of ordinary lives throughout developed and emerging economies. Since early 2017, 82% of all countries issuing National ID cards have implemented eID programs. According to research company Acuity Market Intelligence, the number of electronic National ID cards in circulation will reach 3.6 billion citizens by 2021. This rapidly evolving dominance of electronic IDs reflects the global drive towards eGovernment and eCommerce services enabled by electronic identities. This move, according to Acuity, will provide substantial opportunities as national, regional, and global transaction infrastructures secured by a trusted digital identity scheme emerge over the next five years.

Economic empowerment

The case for eID cards and ePassports is quite straightforward for most people in the eID industry. In the business world, they play a key role in enabling financial services firms and telecoms companies to fulfil Know Your Cus-

tomer (KYC) requirements and carry out Know Your Employee checks. They allow government departments to interact with their citizens more effectively around the clock. In the border control environment, combined with facial recognition and biometric authentication systems, they boost security and improve passenger throughput, giving authorities the confidence that the person standing in front of them is who he or she claims to be.

Emerging economies see the value of eID credentials in general, because they promote economic empowerment, drive democracy and aid economic development as highlighted by the World Bank Group initiative named ID4D . They show the rest of the world that they are modern, secure and trustworthy states, able to implement new technologies and standards - and very much open for business.

Furthermore, secure ID technology that can be used cross-border is important as it promotes regional integration and stability and makes economic development more likely.

This is what the European eIDAS Regulation on digital identification and trust services for digital transactions is trying to achieve. A framework of digital trust will allow European citizens of 31 countries to free themselves from uncoordinated and separate infrastructures.

One of the most innovative aspects of the Regulation is the possibility of accessing many services throughout Europe using the same national digital identity, whether public or private, provided that it has been officially recognized by the authorities of the country where it is currently in use.

Mobile ID

Over recent years, mobile identity (mID) has proved an increasingly popular choice with citizens, thanks to its convenience, ergonomics and high level of security. The rapid adoption of m-Government services in countries that have chosen to focus on mobile communication devices, has demonstrated the appeal of this strong and trusted method of identification.

Some visionary countries have made the leap to mobile ID or mID, through the creation of a mechanism using an eID component for accessing online services via mobile devices. Pioneers include countries where market penetration of cell phones and new technology is strong such as Austria, Estonia, Finland, Norway and Turkey. Oman was the first country in the Middle East to complement its national electronic ID card with a mobile ID scheme.

As a highly trusted channel between citizens and service providers, mobile ID continues to extend its use from egovernment into other online areas such as banking and payment.

Mobile identity (mID) has proved an increasingly popular choice with citizens



Civil liberties

National eID schemes have shown that managing citizen IDs can protect civil liberties, identity and social interactions in a state of law. Electronic records on individual citizens are available upon request of their owner in many European countries with a national eID scheme. When introducing its national eID in Belgium, the government offered citizens an application enabling them to know who has accessed their personal data. And of course the key to accessing this online app is the national eID card. Each citizen can consult their personal file in the national data register to see a record of when government officials have accessed their personal data and for what reason. It is a good example of how transparency and traceability in every transaction between governments and their citizens can help protect privacy and strengthen trust. There is also an emergence of a global consensus on privacy protection specifically incorporating biometric data as illustrated in particular by the regulations known as the General Data Protection Regulation that will be put in place in Europe and the UK in May 2018.

Trust

Digital identity management is at the heart of the Internet economy as a key enabler for trust and innovation. Many countries are now putting in place the framework of their national identity scheme. This helps define the roles of the state, for example as regulator or issuer of digital identities (or neither), responsibilities in organizing data, applications and infrastructure and the underlying principles and operating methods of the digital identity ecosystem such as a federated identity management infrastructure.

Currently, different approaches are being pursued - from a state-led role in issuing digital identities and structuring services, as seen in Estonia or the United Arab Emirates, to the more decentralized system with the German ID card project, or an identity ecosystem developed through a partnership between public and private sectors as is the case in Sweden. Certain nations largely delegate the provision of identity solutions to the market, and therefore the private sector.

by Gemalto



Target/Product
Tax stamps
Ids, cards &
secure documents

Technology
RFID
Holograms
Biometrics
Security printing
Software
Taggants
Track&Trace

Sector
Government & Public Sector
Manufacturing & Retail

- Creation of sovereign security printing industry
- Electronic Passport
- Electronic ID-Card
- Electronic Driving License
- Electronic Vehicle Registration Card
- Electronic Firearms License
- Armed Forces Identity Card
- Animal Traceability System
- Migrant Worker ID-Card
- Document Screening System
- Electronic Social Security Card
- Tax Stamps,Track&Trace System
- Personalization equipment
- Control Stamps for IP Protection
- Creation of Personalization Centers
- Civil Registration Systems
- National Registration Systems
- Multi-Component Security Printing
- VISA/ MasterCard/ UnionPay cards
- Combined eID and eTicketing cards
- Liger CPA chip platform
- Jewelry Passports
- MegaFlex – RFID capable hologram
- Electricity Consumption System
- Water Consumption System
- Electronic Vehicle Identification

www.industrialinnovationgroup.com

Industrial Innovation Group
Building Z-2, exec. suite 85, SAIF
Zone, Sharjah a/p
P.O. Box 9015, Sharjah,
United Arab Emirates

Tel. +971 65 57 07 25
Fax +971 65 57 48 10

info@industrialinnovationgroup.com
www.industrialinnovationgroup.com

NXP

An identification portfolio covering a complete range of ICs for smart cards, tags, labels and readers

NXP's offering ranges from low-cost smart label ICs for high-volume supply chain management applications through to their next generation 32-bit smart-computing platform for powerful multi-application smart cards. The identification portfolio covers a complete range of ICs for smart cards, tags, labels and readers, featuring many coprocessor, security, memory and interface options.

NXP also offer a comprehensive range of contact and contactless reader ICs for various identification applications. NXP RFID technology is utilized in a wide range of applications, including animal identification, public transport, logistics and supply chain management – all supported by their product families Hitag, Mifare, ICode and UCode – covering all RFID frequencies. Its numerous possibilities, plus the fact that there are over 2 billion NXP RFID-based cards, tickets, tags and labels issued and over 7.5 million contactless readers installed worldwide, make it suitable for use in an incredibly wide array of design scenarios.



NXP creates semiconductors, system solutions and software that deliver better sensory experiences in mobile phones, personal media players, TVs, set-top boxes, identification applications, cars and a wide range of other electronic devices. Investment in research and development at NXP is high with some 7,500 engineers working at 26 R&D centers located in 14 countries, they hold over 25,000 patents.

Mikronweg 1
8101 Gratkorn
Austria

Tel. +43 3124 299 324
Fax +43 3124 299 330

www.nxp.com

SPS

Providing secure and high added value components for card and document manufacturers

SPS has delivered several million epassport inlays and e covers based on its unique ebooster technology to Asian, African, and European countries. The Teslin inlay includes an etched antenna on a thin PET layer, enhancing the durability of the inlay. Moreover the module and antenna are electromagnetically coupled without any physical, thus breakable, connection. SPS' technology is designed to accept all chip and OS suppliers on the market, offering a highly reliable, cost effective solution to passport manufacturers. SPS offers unique security features which gives the final passport a unique added value. SPS also propose polycarbonate inlays for electronic and non-electronic data pages.



The company is specialized in the design, manufacture and sale of contactless solutions dedicated to ID cards, e-passport and dual interface banking cards. Headquartered in Rousset, France, with a subsidiary in Singapore, SPS employs 120 people. Part of the French Imprimerie Nationale Group, the company specializes in contactless and dual-interface products, with a recognized micro packaging expertise. SPS has filed over 120 patents supporting its exclusive technologies.

As a world leader in dual interface banking and e-ID documents, the company brings value to its customers by pre-certifying the performance of cards using its technology and guaranteeing card functionality in the field.

85 avenue de la Plaine
ZI de Rousset-Peynier
13790 Rousset – France

Tel. +33 442538830
Fax +33 442538448

www.s-p-s.com
contact@s-p-s.com

ABnote	**MF -C, RFID, NFC -C (MG, CM, SM, CL, FP), M (SL), TAG (RF<HF>)**		
www.abnote.com	2200 Fletcher Avenue, 07024 Fort Lee, NJ, Usa	Tel. 1/201/592/3400	Fax 1/201/224/2762
Access IS Limited	**MF -C, RFID – R (OCR, RF, CL, BC), DC – R (OCR, RF, CL, BC), BC -R (RF, CL, POS)**		
www.access-is.com	18 Suttons Business Park, Reading, Berkshire, RG6 1AZ, United Kingdom	Tel. 44/7748/770 632	Fax 44/118/926/7281
ActivIdentity (HID)	**MF, SH -C -C (SM), R(HH), T (HH), SW**		
www.actividentity.com	6623 Dumbarton Circle, 94555 Fremont, CA, Usa	Tel. 1/510/5740100	Fax 1/510/5740101
AEG Identifikationssysteme GmbH	**MF, SI -C, RFID -C (MG, CM, SM, CL, OPT), M (L, SL, TTR, I) TAG (RF<LF, HF, UHF>), IC, A, P (POS) R (HH, FX, RF, I), RF, EP, GP**		
www.aegid.de	Hörvelsinger Weg 47, 89081 Ulm, Germany	Tel. 49/7/3114/00880	Fax 49/7/3114/0088/9000
Alp Vision	**SH, SI - C, DC - SW, M (MK, VF)**		
www.alpvision.com	Rue du clos 12, 1800 Vevey, Switzerland	Tel. 41/21 948/6464	
Arjo Systems	**SH, SI - B, C -C(CL,CM,SM), DC, EP, GP, H, NFC, R, RFID, T(VT)**		
www.arjo-systems.com	32 rue Jacques Ibert, 92300, Levallois-Perret, France	Tel. +33 (0)181938850	
ARM Ltd	**MF -C -IC**		
www.arm.com	110 Fulbourn Road, CB1-9 NJ Cambridge, UK	Tel. 44/1223/400400	Fax 44/1223/400410
ASK	**MF -C, RFID -C (CL), M (SL), TAG (RF<HF, UHF>), P (HH), R (HH)**		
www.ask-rfid.com	2260 route des Crêtes, BP337, 06906 Sophia-Antipolis, France	Tel. 33/4/97214000	Fax 33/4/92389321
Atlantic Zeiser	**MF, SI, SH -C, RFID -M (L, SL), C (MG, CM, SM, CL, FP), TAG (MK, RF<HF,UHF>), P (I), R (RF), SW, EP, GP, MC, MV**		
www.atlanticzeiser.com	Bogenstraße 6-8, 78576 Emmingen, Germany	Tel. 49/7465/2910	Fax 49/7465/291166
Atmel	**MF -RFID -IC (CL, RF<LF, HF, UHF, MW>)**		
www.atmel.com	2325 Orchard Parkway, 95131 San Jose, CA, Usa	Tel. 1/408/4410311	Fax 1/408/4364200
Atos Worldline	**MF -C -T(POS, HH)**		
www.atosworldline.be	1442 Chaussée de Haecht, 1130 Bruxelles, Belgium	Tel. 32/2/727/6111	Fax 32/2/727/6767
Austria Card	**MF, SH -C -C (MG, CM, SM, CL), M (L, H), A, SW, EP, GP**		
www.austriacard.at	Lamezanstrasse 4-8 , 1230 Vienna , Austria	Tel. 43/1/610650	Fax 43/1/61065701
Axcess International, Inc	**MF, SI -RFID, C -TAG (RF), R, SW**		
www.axcessinc.com	3208 Commander Drive, 75006 Carrollton, TX, Usa	Tel. 1/972/4076080	Fax 1/972/4079085
Bell ID BV	**SH -C -SW**		
www.bellid.com	Stationsplein 45 - Unit A6.002, 3013 AKRotterdam, The Netherlands	Tel. 31/10/885/1010	Fax 31/10/885/1011
BioLink Solutions	**MF, SI -B, C -C (FP), S, SW**		
www.biolinksolutions.com	PO Box 404, _/_ IPS, 511 Avenue of the Americas, PMB 572, 10011 New York, NY, Usa	Tel. 44/808/189/1360	
BGI	**MF-C, RFID-C (CM, CP, MG)**		
www.bginge.com	ZAC de la Goulgatiere, 4 rue Paul Langevin, 35220 Chateaubourg, France	Tel. 33/2/99008997	Fax 33/2/99008998
Blumer Maschinenbau AG	**MF -C -MC**		
www.blumerag.com	Libernstrasse 22, 8112 Otelfingen, Switzerland	Tel. 41/1/8476565	Fax 41/1/8476566

Böwe Cardtec GmbH	**MF -C -MC, SW**		
www.boewe-cardtec.com	Balhorner Feld 28 , 33106 Paderborn, Germany	Tel. 49/5251/180860	Fax 49/5251/1808699
Bundesdruckerei GmbH	**MF, SI, D, SH -C, B -C (SM, CL, FP), P, R (HH, FX), T (FP, FP, FF, VF), SW, EP, GP**		
www.bundesdruckerei.de	Oranienstrasse 91, 10969 Berlin, Germany	Tel. 49/30/25980	Fax 49/30/25982205
CardLogix Corp.	**MF, SH -C -C (MG, CM, S, CL), P (I), T (POS), SW**		
www.cardlogix.com	16 Hughes, Suite 100, 92618 Irvine, CA, U.S.A.	Tel. 1/949/380/1312	Fax 1/949/380/1428
CodeCiphers	**MF, SH -B, C -C (CL) B, IC**		
www.codeciphers.com	Rua Bogaert 107 Villa Vernehla, 04298-020 Sao Paulo, Brazil	Tel. 55/11/2175/1106	Fax 55/11/2175/1171
Cogent Systems, 3M	**MF -B, C, RFID, BC -C (MG, CM, SM, CL, OPT, FP), TAG (RF <HF>) R (HH, FX), S (FX POS, I) T (HH, FX, RF, I, BC, FP, IF, FF), SW, EP**		
www.cogentsystems.com	639 N. Rosemead Blvd., 91107 Pasadena, CA, Usa	Tel. 1/626/325/9600	Fax 1/626/325/9700
Comercial Arqué	**VAR -C, RFID, BC -C (MG, CL), TAG (RF<HF, UHF>), A, P (I, TTR)**		
www.arque.com	Carretera del Mig. No 54, L'Hospitalet de Llobregat, 8907 Barcelona, Spain	Tel. 34/932635100	Fax 34/933372690
Confidex Ltd.	**MF -RFID, NFC -TAG (RF<HF, UHF>, I), M (SL), C (CL)**		
www.confidex.com	Haarlankatu 1B, 33230 Tampere, Finland	Tel. 358/10/4244 100	Fax 358/10/4244 110
Cryptomathic Ltd	**SH, SI -C -SW**		
www.cryptomathic.com	327 Cambridge Science Park, Milton Road, CB4 0WG Cambridge, UK	Tel. 44/1223/225350	Fax 44/1223/225351
Dartagnan BV	**SI, SH -C, B, RFID -C (SM, CL), R (RF), T (RF, FP, IF, FF, VF), SW**		
www.dartagnan.eu	Triport 3, Westelijke Randweg 51, 1118 CRLuchthaven Schiphol, The Netherlands	Tel. 31/20/405/4149	Fax 31/20/405/4171
Databac Group	**MF, SH, SI, VAR, D -C, RFID, B -C (MG, CM, SM, CL, OPT, FP), M (L, SL, TTR, H, I), TAG (RF<HF>), P (TTR), R (HH, FX, RF), S (HH, POS), T (HH, RF, BC, FP, IF, VF), VR, SW, EP, GP**		
www.databac.com	Number One, The Ashway Centre, Elm Crescent, KT2 6HH Kingston, Surrey, UK	Tel. 44/208/546/9826	Fax 44/208/547126
Datastrip Ltd	**MF -B, BC -R (HH), T (FP)**		
www.datastrip.com	7 Thame Park Business Centre, Wenman Road, OX9 3XA Thame, Oxfordshire, UK	Tel. 44/1844/215668	Fax 44/1844/215669
De La Rue Identity Systems	**MF, SI -C -C (CM, CL, SM, FP), SW**		
www.delarue.com	De La Rue House, Jays Close, RG22 4BS Basingstoke, UK	Tel. 44/1256/605000	Fax 44/1256/605004
Deister Electronic	**MF -C, RFID -C (CL), TAG (RF<LF, HF, UHF>), R (HH, FX, RF, I), T (RF)**		
www.deister.com	Hermann-Bahlsen-Str. 11, 30890 Barsinghausen, Germany	Tel. 49/5105/516111	Fax 49/5105/516217

LEGENDA

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- RF = Radio Frequency
- SL = Smart Labels
- SM = Smart
- TTR = Thermal Transfer Ribbon
- UHF = Ultra High Frequency
- VF = Verifier
- VT = Vehicle Terminal

Dermalog Identification System GmbH
MF,SH,SI,VAR,D-B,C,RFID,BC-C(CM,SM,CL,OPT,FP),TAG(RF<HF>),A,R(HH,FX,RF,I),S(HH,FX,POS,I),T(HH,RF,BC,FP),SW
www.dermalog.com | Mittelweg 120, 20148 Hamburg, Germany | Tel. 49/40/4132270 | Fax 49/40/41322789

Digital Identification Solutions AG
MF, SH, SI -C, B -C (CM, CL, SM, MG, OPT, FP), M (TTR, H, I), P (CP, I, TTR), EP, GP, SW, MC
www.digital-identification.com | Teckstrasse 52, 73734 Esslingen, Germany | Tel. 49/711/3416890 | Fax 49/711/341689550

Diletta Maschinentechnik GmbH
MF -C, RFID -C (CL), P (I), GP, EP, MC
www.diletta.com | Industriestrasse 25-27, 64569 Nauheim, Germany | Tel. +49/6152/1804 - 0 | Fax +49/6152/1804-22

DILETTA ID-SYSTEMS

For more than five decades DILETTA has been engaged in producing identity products and security systems for governments and other national institutions. DILETTA offers complete systems for centralized and decentralized personalization of high security travel documents which support all safety criteria, contactless chip technology and machine readable features. With over 30,000 installations in more than 100 countries we have gathered an amazing expertise and ample experience.

Elatec GmbH
MF -C, RFID -C (CM, SM, CL), M (L, SL, I), TAG (RF<LF, HF, UHF, MW>), R (HH, FX, RF, I), SW
www.elatec-rfid.com | Max-Planck-Str. 16, 82223 Eichenau, Germany | Tel. 49/8141/534980 | Fax 49/8141/5349829

Elsag Datamat
MF, SH, SI -C, B, RFID, DC -C (CM, SM, CL), TAG (RF<HF, UHF>), P (I), R (HH, FX, RF, I), S (POS, I, OCR), T (FP, FF), SW, GP, EP
www.elsagdatamat.com | Via Puccini, 2, 16154 Genova, Italy | Tel. 39/010/6582215 | Fax 39/010/6512329

Elyctis
MF, SH - C, RFID - R (RF, HH, FX, CL, OCR), SW
www.elyctis.fr | 240 rue François Gernelle, 84120 Pertuis – France | Tel. +33 6 27 71 37 68

EMJ Data Systems Ltd
D-BC,DC,C,RFID,B-C(MG,CM,SM,FP),M(L,TTR,H),A,P(CP,I,TTR),R(HH,FX,I),S(HH,FX,POS,I),T(HH,FX,RF,I,BT,BC,FP,VT)
www.emj.ca | 7067 Wellington Road. 124, RR6, N1H 6J3 Guelph, ON, Canada | Tel. 1/800/265/7212 | Fax 1/877/801/6300

Entrust Datacard
MF -C, B -C (CM, SM, CL, FP), EP
www.entrustdatacard.com | 1187 Park Place, Shakopee, MN 55379, USA | Tel. 1/952/933 1223 | Fax 44/1489/555601

Evolis
MF -C, RFID -C (MG, CM, SM, CL), M (TTR, H), TAG (RF <LF, HF, UHF, MW>), P (CP, I, TTR, POS), T (POS), SW, EP, GP
www.evolis.com | 14 avenue de la Fontaine , 49070 Beaucouze, France | Tel. 33/2/41367606 | Fax 33/2/41367612

Exceet Group
MF -C, RFID -C (CM, CL, SM), R (HH), TAG (RF <LF, HF, UHF, MW>)
www.exceet.ch | Marktplatz 4, CH-9004 St. Gallen, Switzerland | Tel. 41/4179848/56

Fargo Electronics Inc
MF -C -P (CP, I, TTR), C (MG, CM, SM, CL)
www.fargo.com | 6533, Flying Cloud Drive, 55344 Eden Prairie, MN, Usa | Tel. 1/952/9419470 | Fax 1/952/9417836

Fastcards
MF, SH -C, BC, RFID, B -C (MG, CM, SM, CL)
www.fastcards.com.au | PO Box 3888, 4101 South Brisbane, Qld, Australia | Tel. 61/7/38444623 | Fax 61/7/38464591

Feig Electronic GmbH
MF -RFID, NFC -R (HH, FX, RF, I)
www.feig.de | Lange Strasse 4, 35781 Weilburg, Germany | Tel. 49/6471/31090 | Fax 49/6471/310999

Fingerprint Cards AB
MF -B -IC, T (FP), C (FP), SW
www.fingerprints.com | P O Box 2412 (Kungsportsplatsen 2), 403 16 Gothenburg, Sweden | Tel. 46/31/607820 | Fax 46/31/137385

FobaLaserMarking + Engraving(Alltech)
MF -C, DC -MC, TAG (MK), MV
www.fobalaser.com | An der Trave 27-31, 23923 Selmsdorf, Germany | Tel. 49/38823/550 | Fax 49/38823/55222

www.sustainabledevelopmentmagazine.com

Fortress GB Limited	**SI -RFID, C -C (SM, CL, FP), TAG (RF<HF>), T (HH, FX, RF, HG, POS), SW**		
www.fortressgb.com	South Block, Tavinstock Square, Tavinstock House, WC1H 9LG London, UK	Tel. 44/20/7874/7595	Fax 44/7874/7599
Gemalto	**MF -C -C (CM, SM, CL), EP, GP, T (HH, POS), R (FX, HH), SW**		
www.gemalto.com/govt	6, rue de la Verrerie, 92127 Meudon Cedex, France	Tel. 33/1/5501/50 00	
GET Group	**SI - C - P (CL, CM, VF)**		
www.getgroup.com	230 Third Avenue, Waltham, MA 02451 – USA	Tel. +1 781 890-6700	Fax +1 781 890-6320
Ghirlanda SpA	**MF, SI -C -C (MG, SM), SW, GP, EP**		
www.ghirlanda.it	via Galileo Ferraris, 80/90, 20010 Marcallo con Casone, MI, Italy	Tel. 39/02/972331	Fax 39/02/9761657
Giesecke & Devrient GmbH	**MF, SI -C, B, NFC, RFID -C (SM, CL, FP), M (H), IC, P (CP, I), R (FX), T (FX, BC, FP, FF), EP, GP**		
www.gi-de.com	Prinzregentenstrasse 159, 81677 Munich, Germany	Tel. 49/89/41190	Fax 49/89/41191535
HID Global	**MF -C, RFID -C (MG, CM, SM, CL, OPT), M (TTR, H, I), TAG (RF,LF,UNF HF), IC, P (CP, I, TTR, POS). R (HH, FX, RF, I), SW, EP**		
www.hidglobal.com	15370 Barranca Pkwy, 92618 Irvine, CA, Usa	Tel. 1/949/732/2000	Fax 1/949/732/2120
Hirsch Electronics Corp.	**MF -B, C, RFID -C (MG, CM, SM, CL, OPT, FP), TAG (RF<LF, HF, MW>), R (HH, FX, RF, I), T (HH, FX, RF, I, BC, FP, IF, VT, VF), SW, EP, GP**		
www.hirschelectronics.com	1900-B Carnegie Ave., 92705 Santa Ana, CA, Usa	Tel. 1/949/250/8888	Fax 1/949/250/7372
HJP Consulting	**SH, SI -C, RFID -SW**		
www.hjp-consulting.com	Hauptstraße 35, 33178 Borchen, Germany	Tel. 49/5251/417760	Fax 49/5251/4177666
Honeywell Access Systems	**MF, SH -RFID, B -C (MG, CM, SM, CL, FP), M (TTR, H), P (TTR), R (HH, RF), S (HH)**		
www.honeywellaccess.com	2700 Blankenbaker Pkwy, Suite 150, 40291 Louisville, KY, Usa	Tel. 1/800/6753364	Fax 1/502/2975770
IAI Industrial Systems	**MF - C - EP**		
www.iai.nl	De Run 5406, 5504 DE Veldhoven – The Netherlands	Tel. 31/40/2542445	Fax 31/40/2545635
Identitas	**D -C, B -C (CM, SM, OPT), T (FP), GP, EP**		
www.identitas.it	Via Tiburtina 912, 00156 Rome, Italy	Tel. 39/06/4072199	Fax 39/06/4086199
Identive Group	**MF -RFID -TAG(RF<HF, UHF>), M (SL), D – RFID, NFC – IC, TAG (RF<LF, HF>)**		
www.identive-transponders.com	Mu_hlweg 2c, 82054 Sauerlach, Germany	Tel. 49/8104/6495100	Fax 49/8104/6495110
Idesco Oy	**MF -RFID, C -C (SM, CL), TAG (RF<LF, HF>), R (RF), T (RF)**		
www.idesco.fi	Teknologiantie 9, 90570 Oulu, Finland	Tel. 358/20/74384175	Fax 358/20/7434176

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IDTeck	**MF, D -C, B, RFID -C (CM, SM, CL), TAG (RF<LF, HF, UHF>), T (RF, FP, FF, VF), SW**		
www.idteck.com	5F, Ace Techno Tower B/D 684-1, Deungchon-Dong, Gangsuh-Gu, 157-030 Seoul, Korea	Tel. 82/2/26590055	Fax 82/2/6590086
iDTronic	**MF -C, RFID -C (CL), M (SL), TAG (RF<LF, HF, UHF>), R (HH, FX, RF, I), T (RF)**		
www.idtronic-group.com	Donnersbergweg 1, 67059 Ludwigshafen am Rhein, Germany	Tel. 49/621/66900940	Fax 49/621/66900949
Imprimerie Nationale Groupe	**MF, SI, - C, B - C, EP, R, SW**		
www.imprimerienationale.fr	104 avenue du Président Kennedy, 75016 Paris	Tel. 33 01 4058300	Fax 33 01 40583085
ImageWare Systems, Inc.	**MF, SH -B, C -T (FP, HG, IF, FF), VR, SW**		
www.iwsinc.com	10883 Thornmint Rd , 92127 San Diego, CA, Usa	Tel. 1/858/673/8600	Fax 1/858/673/1770
Industrial Innovation Group	**MF, SH – C, B, NFC, RFID – C(MG, CM, SM, CL, FP), M(L, H), TAG(RF), P(I), SW, EP, GP, MC**		
www.industrialinnovationgroup.com	Building Z-2, Executive suite 85, SAIF Zone, Sharjah a/p, P.O. Box 9015, Sharjah, UAE	Tel. 00971 6557 0725	Fax 00971 6557 4810
Ingenico	**SH, SI -C, B -T (HH, FX, RF, CL, BC, FP, POS), SW, VT**		
www.ingenico.com	192 avenue Charles de Gaulle, 92200 Neuilly, France	Tel. 33/1/46258200	Fax 33/1/47725695
InkSure Technologies Inc	**MF -RFID, BC -M (L, TTR, H), TAG (MK)**		
www.inksure.com	P.O. Box 7006, 19407 Audubon, PA, USA	Tel. 1/954/772/8507	
Innova Card	**MF -C -IC, SW**		
www.innova-card.com	ZI Athélia IV - Le Forum, Bât. A, Quartier Roumagoua, 13600 La Ciotat , France	Tel. 33/4/42981480	Fax 33/4/42083319
Intelcav	**MF -C -C (MG, CM, SM, CL, OPT, FP, H)**		
www.intelcav.com	Rua Hungria 514, 50 andar Jardim Paulistano, SP 01455-000 São Paulo, Brazil	Tel. 55/11/2169/0750	Fax 55/11/2169/0769
Interflex Datensysteme GmbH & Co. KG	**MF, SI -B, C -T (RF, FP), SW**		
www.interflex.de	P.O. Box 81 03 60, 70520 Stuttgart, Germany	Tel. 49/711/13220	Fax 49/711/1322/111
International Bar Code	**MF -C, BC -C (CL), R (RF), S (FX, I)**		
www.interbar.com	160 Oak Street, 06033 Glastonbury, CT, Usa	Tel. 1/860/6599660	Fax 1/860/6573860
International Biometric Group	**SI -B, C -SW**		
www.biometricgroup.com	One Battery Park Plaza, 10004 New York, NY, Usa	Tel. 1/212/8099491	Fax 1/212/8096197
International Security Tech.	**MF -C, BC, B -C (MG, CM, SM, CL, OPT, FP)**		
www.ist-china.com	No. 99 Meicun Road, 518049 Shenzhen , Guangdong , P. R.China	Tel. 86/755/83124964	Fax 86/755/83315467
Iris Corporation Berhad	**MF, SI, SH, D, VAR -C, B -C (CM, SM, CL, CMA), B (FF), P (CP), R (HH, FX, RF, I), T (IF, HH, FX, I, FP, L, MK, OCR), SW, EP**		
www.iris.com.my	Iris Smart Technology Complex, Technology Park Malaysia, 57000 Bukit Jalil, Kuala Lumpur, Malaysia	Tel. 603/89960788	Fax 603/89960441
Ixla srl	**MF -C -MC, SW, GP, EP**		
www.ixla.it	Via Ponte Chiusella 28, 10090 Romano Canavese, Italy	Tel. 39/0125/719286	Fax 39/0125/718455

Desktop laser systems for personalization of eID and ePassport, IXLA fully owns its technology and has more than 1.100 systems installed in 37 Countries. Thanks to these successes, IXLA has become a benchmark for the industry and a qualified partners of the upmost important players for the ID documents GSP.

Keynectis	**SH - C - SW (SM, CM, CL, VF)**		
www.keynectis.com	11-13 rue René Jacques - 92131 Issy-les-Moulineaux Cedex, France	Tel. +33 1 55 64 22 00	Fax +33 1 55 64 22 01
Keyware	**MF, SH, SI -C -C (MG, CM, SM, CL, FP), T (RF, POS), SW, EP**		
www.keyware.com	Ikaros Business Park, Ikaroslaan 24, 1930 Zaventem, Belgium	Tel. 32/2/3462523	Fax 32/2/3471688
Kronos Systems Ltd	**MF -B, C -T (FP)**		
www.kronos.com/uk	Kronos House, Carey Road, RG40 2NP Wokingham, UK	Tel. 44/118/9789784	Fax 44/118/9782214
Kugler Womako	**MF - C - MC, C (CMA)**		
www.kugler-womako.com	Schlosserstraße 15, 72622 Nürtingen, Germany	Tel. +49 7022 70020	Fax +49 7022 33444
Labau Technology Corporation	**MF -BC, C -R (HH, FX), P (CP, TTR), S (FX), T (POS)**		
www.labau.com.tw	3F-3, No 125, Ln 235, Bau Chiau Road, 231 Taipei, Taiwan	Tel. 886/2/89191371	Fax 886/2/89191771
Linxens	**MF - C, RFID, NFC - TAG (RF <LF,HF, UHF>), A, M(SL), C (CL)**		
www.linxens.com	6 Rue Marius Aufan, 92300 Levallois Perret – France	Tel. +33 1 41343450	Fax +331 47576492

Linxens is a world-class provider of component-based solutions for the security & identity market. We design and manufacture Microconnectors and RFID Antennas and Inlays. With 8 production facilities in Asia, Europe and North America, 4 R&D Centers, and over 3000 employees, Linxens makes its large-scale production capacity available to its customers, and delivers guaranteed product and technical reliability. Linxens technology gives users the best connection possible. Linxens crafting the future of connections.

Logicode PTE Ltd	**D -BC, C, RFID -S (HH, FX), R (RF), P, T (RF, BT, BC)**		
www.logicode.com.sg	10 Ubi Crescent #05-28, 408564 Ubi Techpark (Lobby B), Singapore	Tel. 65/64588/337	Fax 65/64588/553
Magna Carta Chipcard Solutions	**MF -C -C (MG, CM, SM, CL), T, SW**		
www.magna-carta.com	Naritaweg 126, 1043 CAAmsterdam, Holland	Tel. 31/20/582/20/50	Fax 31/20/582/20/51
Magtek	**MF -C -S (POS), T (POS)**		
www.magtek.com	20725 South Annalee Avenue, 90746 Carson, CA, Usa	Tel. 1/800/421/5208	

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- SL = Smart Labels
- SM = Smart
- TTR = Thermal Transfer Ribbon
- UHF = Ultra High Frequency
- VF = Verifier
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Masktech GmbH
SH -C, B, RFID -IC, SW
www.masktech.de
Nordostpark 45, 90411 Nuremberg, Germany
Tel. 49/911/955149-0
Fax 49/911/955149-7
sales@masktech.de

MaskTech is the leading independent provider of high security multi-application operating systems (OS) and customized Flash/ROM masked products for electronic travel documents and ID applications. Our embedded solution (MTCOS) protects e-documents in more than 65 countries worldwide. MTCOS is a fully open standard (ISO/IEC) compliant, Common Criteria EAL5+ certified operating system which includes a large variety of ID applications e.g. ICAO/BSI ePassport, national e-ID, -sign, -health, -driving license and PKI. It supports the RFID, dual interface or contact interface.

Matica System S.r.l.
MF -C -C (MG, CM, SM, CL, FP), M (TTR, I), P (I, TTR), EP, GP, MC, MV
www.maticasystem.com
Via G. Rossa 4/6, 20037 Paderno Dugnano (MI), Italy
Tel. 39/02/92272501
Fax 39/02/91084372

Maurer Electronics GmbH
MF -C -MC
www.maurer-electronics.de
Hanauer Strasse 1, 80992 Munich, Germany
Tel. 49/89/139268630
Fax 49/89/1392680

Melzer maschinenbau GmbH
MF -C, RFID -MC, C (MG, CM, SM, CL), M (L, SL), TAG (MK, RF<LF, HF, UHF, MW>)
www.melzergmbh.com
Ruhrstr 51-55, 58332 Schwelm, Germany
Tel. 49/2336/9292/80
Fax 49/2336/9292/85

For over 60 years of experience MELZER has been internationally recognized and established as the leading equipment supplier for the production of the most advanced ID documents, Smart Cards, DIF Cards, RFID Inlays and e-Covers for Passports. Customized solutions, the modular machine system and the lean production approach ensure and maintain unsurpassed yield rates, flexibility and profitability. The MELZER product portfolio also includes a broad range of versatile RFID converting equipment.

Microsoft Corporation
SH -C, B, RFID, DC -SW
www.microsoft.com
One Microsoft Way, 98052-6399 Redmond, WA, Usa
Tel. 1/800/642/7676
Fax 1/425/936/7329

Morpho
MF, SI -C, B -C (CM, SM, CL, FP), R (RF), T (RF, FP, IF, FF), SW, EP, GP
www.morpho.com
Le Ponant de Paris 27, rue Leblanc, F-75512 Paris Cedex 15, France
Tel. 33/1/5811/2500
Fax 33/1/4070/2550

Mühlbauer Group
MF, SH, SI -RFID, C -C, M (SL), TAG (MK, RF), P (CP, I, TTR), T (FX, RF, I, BT, FP, IF, FF, VF), SW, EP, GP, MC, MV
www.muehlbauer.de
Josef-Muehlbauer-Platz 1, 93426 Roding, Germany
Tel. 49/9461/9520
Fax 49/9461/9521101

Multicard AG
MF -C -C (MG, CM, SM, CL), T (FP, FF, VF)
www.multicard.com
Widenholzstrasse 1, 8304 Wallisellen, Switzerland
Tel. 41/44/8779000
Fax 41/44/8310003

Nadra
VAR, SI, SH -C, B, RFID, DC -SW, EP, GP
www.nadra.gov.pk
State Bank of Pakistan Building, Shahrah-e-Jamhuriat, G-5/2, 44000 Islamabad, Pakistan
Tel. 92/51/9205568
Fax 92/51/9202939

Nagra ID
MF -C, RFID -C (MG, CM, SM, CL), M (L, TTR, H, I), TAG (RF<LF, HF, UHF>), EP, GP
www.nagraid.com
Crêt du Locle 10, 2301La Chaux-de-Fonds, Switzerland
Tel. 41/32/9240404
Fax 41/32/9240400

NBS Technologies Limited
MF -C -C (MG, CM, SM, CL) M (TTR, H), P (CP, I, TTR), SW, EP, GP
www.nbstech.com
B1 Moorfield Point, Slyfield Industrial Park, GU1 1RU Guildford, Surrey , UK
Tel. 44/1483/563200
Fax 44/1483/511189

NEC Solutions (America) Inc
SI -B -T (FP), SW
www.necam.com/ids/law
10850 Gold Center Drive, Suite 200, 95670 Rancho Cordova, CA, Usa
Tel. 1/800/777/2347
Fax 1/916/4637041

Nexus
SH, SI -C, B, NFC, RFID -SW, EP, GP
www.vps.de
Carl-Zeiss-Strasse 2, 76275 Ettlingen, Germany
Tel. 49/7243/54880
Fax 49/7243/548811

Nfive Software	**SH -C, BC, RFID, B -SW**		
www.nfive.com	Edificio OneWorld, Urb Belo Horizonte Lt20, 2655-241 Ericeira, Portugal	Tel. 351/261/860450	Fax 351/261/865/647
Oberthur Technologies	**MF, SI -C -C (MG, SM, CL), SW, EP, GP**		
www.oberthurcs.com	50, quai Michelet, 92300 Levallois-Perret, France	Tel. 33/1/ 5546/7200	Fax 33/1/ 5546/7201
Omnia Technologies	**MF -RFID, C -TAG (RF<LF, HF, UHF>)**		
www.omniatags.com	Plot No. 68, Sector - 5, IMT Manesar, 122050 Gurgaon, Haryana, India	Tel. 91/124/4366411	Fax 91/1244366410
Orell Füssli	**MF -C -C (CL,CM), EP**		
www.ofs.ch	Dietzingerstrasse 3, CH 8036 Zurich, Switzerland	Tel. 41/44/466/7711	Fax 41/44/466/7901
Otto Künnecke GmbH	**MF, SI -C -C (MG, SM), GP, EP, MC**		
www.kuennecke.com	Zeppelinstrasse 10, 37603 Holzminden, Niedersachsen, Germany	Tel. 49/5531/9300545	Fax 49/5531/9300903
PAV Card GmbH	**MF -C, RFID -C (MG, CM, SM, CL), EP, GP, TAG (RF<HF>), M**		
www.pavcard.de	Hamburger Strasse 6, 22952 Luetjensee, Germany	Tel. 49/4154/7990	Fax 49/4154/799151
Prooftag	**MF -C -C (OPT), M (L), TAG (MK)**		
www.prooftag.com	350, Av d'Italie, 82000 Montauban, France	Tel. 33/5/63211050	Fax 33/5/63211058
ruhlamat GmbH	**MF - C, RFID - A, C(CL), EP (MK), GP, MC**		
www.ruhlamat.com	Sonnenacker 2, 99819 Marksuhl, Germany	Tel. 49/369259290	Fax 49/36925929111

ruhlamat is an innovative engineering and machine building company with its headquarters located in Germany. Activities are focused on smart card and passport processing technology, e.g. passport production and personalization, card production and personalization, module preparation as well as Inlay/RFID solutions and special machinery. ruhlamat branches and representations throughout the world create an ideal basis for a professional and area-spanning service network.

RF IDeas Inc	**MF -RFID, NFC -C (MG, CM,SM, CL), TAG (RF<LF, HF>), R (RF)**		
www.rfideas.com	4020 Winnetka Ave, 60008 Rolling Meadows, IL, Usa	Tel. 1/847/8701723	Fax 1/847/4831129
Safe ID Solutions AG	**MF, SI -C, RFID -C (CL), GP, EP, SW, MC**		
www.safe-id.de	Ottobrunner Str. 43, 82008 Unterhaching, Germany	Tel. 49/89/4521260	Fax 49/89/452126126
SafeNet, Inc.	**MF -C -C (SM), SW**		
www.safenet-inc.com	4690 Millennium Drive, 21017 Belcamp, MD, U.S.A.	Tel. 1/410/931/7500	Fax 1/410/931/7524

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- SM = Smart
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- VF = Verifier
- VT = Vehicle Terminal

Schreiner LogiData
MF -C, RFID, BC -C (SM, CL), M(L, SL, I), TAG (RF<HF, UHF>)
www.schreiner-logidata.com | Bruckmannring 22, 85764 Oberschleissheim, Germany | Tel. 49/89/31584/4140 | Fax 49/89/31584/4109

SCM Microsystems (Identiv)
MF -RFID, NFC -R (HH, FX, RF), T (HH, FX, RF)
www.scmmicro.com | Oskar-Messter-Straße 13, 85737 Ismaning, Germany | Tel. 49/89/9595/5000 | Fax 49/89/9595/5555

SecureTech Consultancy
SH, SI, VAR - C (CL, CM, SM), EP, T (FF, OCR, TTR)
www.securetech-consultancy.com | 827, Street No. 85, I-8/4, Islamabad-44000, Pakistan | Tel. +92 51 111 111 782 | Fax +92 51 4436480

Selex Elsag
MF, SH, SI -C, B, RFID, DC -C (CM, SM, CL), TAG (RF<HF, UHF>), P (I), R (HH, FX, RF, I), S (POS, I, OCR), T (FP, FF), SW, GP, EP
www.selexelsag.com | Via Puccini, 2, 16154 Genova, Italy | Tel. 39/010/65821 | Fax 39/010/6512898

SICPA Security Solutions
MF, SH - C - P, SW, TAG (L, MK)
www.sicpa.com | Av de Florissant 41, 1008 Prilly – Switzerland | Tel. +41 21 627 61 55 | Fax +41 21 627 57 27

At the core of SICPA's security expertise are high-performance security inks that protect the majority of the world's banknotes, security documents and value documents from counterfeiting and fraud. SICPA's Government Security Solutions Division enables Governments to protect tax revenues and deliver associated policy objectives by providing unique and secure authentication and traceability solutions. SICPATRACE® combines material based security with state-of-the-art information technology which enables our partner Governments to secure revenue and protect consumers. SICPA is a pioneer in this field and has successfully implemented and operated nationwide track and trace solutions for Governments worldwide.

Sitroncis
MF -C -C (SM), IC
www.sitronics.com | 39/5 3-ya Tverskaya-Yamskaya St. Building I, 125047 Moscow, Russia | Tel. 7/495/2250030 | Fax 7/495/2250036

Skidata AG
MF, D, SI -C, RFID -C (SM, CL, OPT, MG), M (L, TTR), TAG (RF<LF, HF>), P (CP, TTR), R (HH, FX, RF), S (HH, FX, POS), SW, T (HH, FX, BC, POS, VT)
www.skidata.com | Unterbergstrasse 40, 5083 Grödig - Salzburg, Austria | Tel. 43/6246/8880 | Fax 43/6246/8887

Smartware
MF -C, RFID -EP, GP, R (RF)
www.smartware.fr | 11, Avenue des Andes, Le Carthagène, Z.A. de Courtaboeuf, 91940 Les Ulis, France | Tel. 33/1/6486/2525 | Fax 33/1/6486/2526

SPS - Smart Packaging Solutions
MF - C - A, C (CMA, CL, HF), IC, DATAPAGE
www.s-p-s.com | 85 avenue de la Plaine, ZI de Rousset-Peynier, 13790 Rousset – France | Tel. +33 4 42 53 88 30 | Fax +33 4 42 53 84 48

Spartanics
MF -C, RFID -C (MG, CM, SM), M (L), P (I)
www.spartanics.com | 3605 Edison Place, 60008 Rolling Meadows, IL, Usa | Tel. 1/847/3945700 | Fax 1/847/3940409

STMicroelectronics
MF -C, RFID, B -C (CM, SM, CL, FP), M (SL), TAG (RF<HF, UHF>), IC
www.st.com | 39, Chemin du Champ des Filles CP 21, 1228 Plan-Les-Ouates, Geneva 15, Switzerland | Tel. 41/22/9292929 | Fax 41/22/929/2900

Studio Card Ltd.
SI, VAR, D -C, RFID -C (CL, SM), M, TAG (RF<LF, HF>), R (RF), T (RF)
www.rfid.bg | 36, Dragan Tsankov Blvd., Interpred World Trade Centre, Office B 324, 1040 Sofia, Bulgaria | Tel. 359/886/718545 | Fax 359/2/9693330

Symbolic S.p.A.
D -C -C (SM)
www.symbolic.it | Viale Mentana 29, 43121 Parma, Italy | Tel. 39/0521/708811 | Fax 39/0521/776190

Szzt Electronics Group
MF -C, DC -C (MG, SM), R, P, T (HH, BC, POS), SW, EP, GP
www.szzt.com | 5/F, West Coast Bldg, Nan You Rd, 518054 Nan Shan Dist., Shenzhen, Guangdong, China | Tel. 86/755/26490094 | Fax 86/755/26490099

Texas Instruments RFID Systems
MF -RFID, C -C (CL), M (SL), TAG (RF<LF, HF, UHF>), IC, A, R (HH, FX, RF), T (RF), SW
www.ti-rfid.com | 6550 Chase Oaks Blvd, 75023 Plano, TX, Usa | Tel. 1/800/962/7343 | Fax 1/214/567/7343

Thales	**MF, SI -B, NFC -IC, A, T(FX, FP, IF, FF), SW, EP**		
www.thalesgroup.com	20-22 rue Grange Dame Rose, 78141 Velizi, France	Tel. 33/1/73320000	
Trüb AG	**MF, SI -C, B, NFC -C (MG, CM, SM, CL, FP), M (H), TAG (RF<LF, HF>), IC, A, P (TTR), SW, EP, GP, MC**		
www.trueb.ch	Hintere Bahnhofstrasse 12, 5001 Aarau, Switzerland	Tel. 41/62/8320000	Fax 41/62/8320100
Ultra Electronics Card Systems	**MF -C, BC -M (TTR, H), P (CP, TTR)**		
www.magicard.com	Hampshire Road, DT4 9XD Weymouth, Dorset, UK	Tel. 44/1305/784738	Fax 44/1305/777118
Unisys	**SI, SH, VAR -C, B -C (MG,SM,OPT,FP), T (HH, FX, RF, BT, BC, FP, IF, FF, VF), VR, SW, EP, GP**		
www.unisys.com/biometrics	801 Lakeview Drive, 19422 Blue Bell, PA, Usa	Tel. 1/215/986/4011	
Vasco Data Security International	**MF -C -R (HH), SW**		
www.vasco.com	Koningin Astridlaan 164, 1780 Wemmel, Belgium	Tel. 32/2/6099700	Fax 32/2/6099709
VeriFone, Inc.	**MF -C -T (HH, POS), P, SW**		
www.verifone.com	2099 Gateway Place, Suite 600, 95110 San Jose, CA, Usa	Tel. 1/408/232/7800	Fax 1/408/232/7811
Verisign	**SI -C, DC, RFID -C, SW**		
www.verisign.com	487 E. Middlefield Road, 94043 Mountain View, Usa	Tel. 1/650/4263535	
Vision-Box	**MF -C, B -C, R (FX, FF, FP, VF), T**		
www.vision-box.com	Rua Casal do Canas n.2, Zona Industrial de Alfragide, 2790-204 Carnaxide, Portugal	Tel. 351/21/154/3900	Fax 351/21/154/3901
Vlatacom d.o.o.	**MF, SI, SH -C, B, DC -R(HH, FX,RF<HF>), S(OCR), T (HH, BC, FP, FF, RF, VF), SW, EP, GP**		
www.vlatacom.com	5 Milutina Milankovica, 11070 Belgrade, Serbia	Tel. 381/11/377/1100	Fax 381/11/377/1199
Wick Hill Group plc	**D -B, C -C (SM, CL, FP), SW, EP**		
www.wickhill.com	River Court, GU21 5RP Woking, UK	Tel. 44/1483/227600	Fax 44/1483/227700
Wincor Nixdorf International GmbH	**MF, SH, SI -RFID, C -T (HH, FX, RF, BC, POS, VF), R (HH, FX, POS), SW, P (CP)**		
www.wincor-nixdorf.com	Heinz-Nixdorf-Ring 1, 33106 Paderborn, Germany	Tel. 49/5251/69330	Fax 49/5251/6936767
WiseKey	**MF, SH - C, DC - T (VF), SW**		
www.wisekey.com	World Trade Center II, 29, Route de Pré-Bois, P.O. Box 853, CH- 1215 Genève 15, Switzerland	Tel. +41 22 594 30 00	
ZeitControl cardsystems	**MF -C, RFID -M (SL), TAG (RF<LF, HF>), A, R (HH,FX,RF,I), T (HH,FX,RF,I), EP, MC**		
www.zeitcontrol.de	Siedlerweg 39, 32429 Minden, Germany	Tel. 49/571/505220	Fax 49/571/5052299

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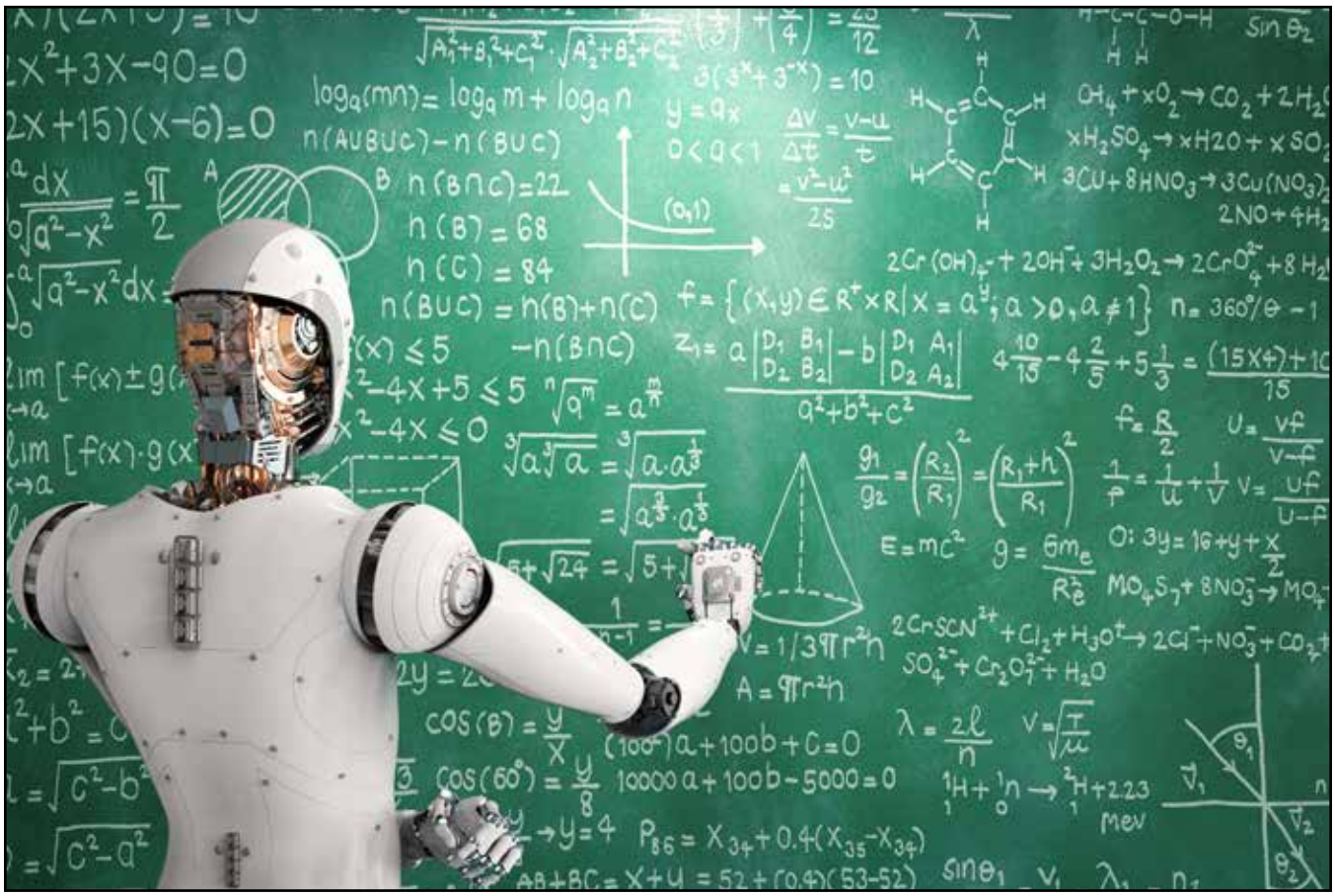
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Empowering education through AI

Technological advances, economic investment, as well as social and cultural changes are contributing to the expectation that the education sector must integrate new technologies into its agenda. Artificial intelligence is bringing a whole new transformation to the concept and rationale for using technology to promote learning throughout life



As the digital world becomes part of the broader cultural environment, technological literacy is increasingly vital for participation in day-to-day activities. Education can offer a vision of culture that empowers learners to interpret and actively engage in the new formats and contents of digital culture. Artificial intelligence is one such technology that is pervading almost every walk of life. Suvi Lindén, UN Special Envoy to the ITU Broadband Commission for Digital Development, believes the use of this disruptive technology in education can also improve the quality of teaching and learning by empowering teachers and students with new transformational methods.

How has the digital era impacted on culture and education?

The Internet is a disruptive technological advancement which has made a huge impact on society and indeed civilization itself because, having a broadband infrastructure in place, it brought access to information and therefore education. Overall there has been a big impact which means everyone can now benefit as with the resulting new flexibility, comes increased opportunities for educational access.

ICT in general, and broadband in particular, have the potential to create highly versatile education and training environments that can provide equal access to learners regardless of gender, geographic location, socio-economic or ethnic background, ill-

ness or disability, or any other circumstance that would normally hinder the provision of high-quality education.

Is this the dawn of a new era for advanced data technologies in education?

I think artificial intelligence is going to be as disruptive as the Internet was when it came in. AI is a technology that learns from people. Before this everything needed to be pre-programmed and planned and was therefore predicted, but now AI learns from us and is therefore changing the way in which teachers educate and students learn.

Through AI, learning becomes highly individual with advice on depth and level of study, because it can understand the capabilities which a student has in math or the sciences, for example. Learning can therefore be specific without an overall need for common methods. Similarly for teachers, it gives information on the level of students' learning, what are hot topics and which methods of teaching should or could be done differently.

In this scenario, AI understands the capabilities of each student so teachers can adapt. Overall it means education becomes much more personalized and this will be very disruptive in this field.

Do you see AI becoming a change factor that will undermine the cultural legacy and capacity of people to learn or will it empower them?

I hope AI has the capability to empower, but at the end of the day, the human being must remain the master with the technology supporting this role. As a disruptive technology, AI offers enormous possibilities helping in every walk of life and sector, much as digitalization has done.

So in essence, civilization will be empowered through AI. It will augment - not detract from culture and education offering dramatically powerful tools for students to personalize learning and allow teachers to develop individual ways to support learning. Culture will be empowered individually and collectively through the added value of AI. It will make the difference in education by providing new tools to bring new benefits to all walks of life.

Do you see AI impacting other sectors - for example in the finance sector, where the trust that estate owners and investors had, has been eroded in recent years as a result of banks having too much control?

Independent data intelligence is finally playing a key role in providing the possibility to bring back trust in finance. However, nobody can predict today how long it will take to re-establish investor confidence. Over the last decades, information and communication technology has been the main driver of innovation and development in the world of finance. Banks have the computational power, access to data in real-time and analytical algorithms that enable them to pursue maximum performance and to reap opportunities by performing transactions planned and executed within the millisecond. It is now essential to turn once more to the digital world as it furthermore provides the tools for transparency and accountability that play a key role in the establishment of trust models in all sectors and particularly in the financial domain.

In developed countries it is necessary to introduce methodologies for independent control, in order to establish confidence of those who provide the funds. As these same tools become available in the developing world, societies can aspire to a quantum leap in modernization and establish a new credibility in combating corruption and fraud. Overall, this leap means the disruptive tools born from artificial intelligence, provide a solid base from which to increase two-way transparency in all financial flows and create a trustworthy global finance sector.

The introduction of AI into education methods, means learning can be specifically tailored to the individual student's capabilities





Meet Suvi Lindén

Suvi Lindén is the UN Special Envoy to the ITU Broadband Commission for Digital Development and advisory board member of the Finance Transparency Forum. She was Finland's Minister of Communications in 2007-2011 and was previously Minister of Culture, 1999-2002. In Parliament she has been Chair of the Education and Culture Committee, and Vice Chair of the parliamentary group of the National Coalition Party. She has also been Member of the Speaker's Council, and a number of key government committees.

Embracing the rise of cloud biometrics

As the digital world embraces biometric authentication for identification, there is an argument that says moving the authentication process to the Cloud is more beneficial than keeping it on-device. This process is referred to as Biometric Identity as-a-Service, or BIDaaS, displaying benefits of moving server-side



Biometric authentication is officially mainstream, with researchers suggesting that within five years, biometric authentication could be enabling 1.37 trillion payment and non-payment transactions.

In both consumer and business worlds, there is a new voracious appetite for all things biometrics; from facial scans to vein pattern recognition, fingerprints to behavioral monitoring. Apprehension has moved through simple acceptance to something more exciting, as we embrace wearable technologies that measure and monitor us, talk to would- be intruders when miles from home, and even pay for our dinner by smiling at cameras.

But the true value of biometric authentication is stifled all the time that the authentication procedure is restricted to the devices in use.

Using facial scanning technology or fingerprints that match to a biometric template stored on the device only serves to link the person to the device. The real value of using biometric authentication will be unleashed when organizations move the process away from the device, to the Cloud.

Cloud-based authentication

Device authentication is not identity authentication. Linking a mobile banking app to a device simply creates a link between the device and the account, and the authentication process reconfirms this link. A BIDaaS platform creates and stores a unique digital template for the genuine consumer, which is held securely in the cloud, in the form of a mathematical construct, so that a bank can verify that it is the correct person, not just the correct device, performing a transaction. Jump to the last page of this report for a quick reference guide of Cloud vs On-Device.

BIDaaS allows the use of passive (behavioral) biometrics monitoring. By combining behavioral biometrics with deep learning, a richer understanding of the user is reinforced with every action, so that step-up authentication is only applied when strictly necessary. This appropriate level of friction works for both the financial institution and the customer.

Critical to the long-term viability of a financial institution is its commitment to improving the Digital Journey for its customers. By providing the mechanism to securely store a unique digital template for each of its customers, verified against a vetted identity document, a bank not only enables rapid onboarding and authentication for new customers or existing customers for new products, but can apply passive (behavioral) biometrics all the while a customer engages with the bank. This continual background monitoring ensures that the customer's transactions are safe, and the only time the customer is actively engaged is if abnormal behavior is detected.

Multiple channels

When a centralized template of an individual's profile is stored in the secure Cloud, a user can enroll using a single device and that template be used across multiple channels. According to research company, Acuity, biometrically-enabled smartphones will create the opportunity to leverage Unique Verifiable Identifiers as the basis of authentication for financial services across platforms, modalities and borders. This both simplifies the customer's journey and eliminates the ability to create multiple identities on a single device; a key indicator of account fraud. Furthermore, the frustration of losing or damaging a device is somewhat mitigated, as the user would not need to re-enroll their biometric information on a new device.

In addition, concerns about biometric data storage and management in the Cloud being subject to loss, theft, and potential misuse have been sensationalized, researchers say. BIDaaS creates and stores a unique, irreversible digital template of an individual on its servers, away from the personal information held on a device or on-premise at an organization.

Performing the authentication server- side using an algorithmic construct rather than information, pictures, passwords or other vulnerable forms is far safer than authenticating on-device, as the template is encrypted, anonymous and impossible to reverse-engineer.

Deep learning

There is also the additional value of adding machine learning to the authentication process, referring to the process of being able to continuously improve the ability to re-organize individuals and identify fraudsters. Indeed, when authentication happens in the Cloud, it is possible to apply deep learning techniques using a backdrop of millions of records, to identify unique patterns and improve user recognition on a continual basis. The scale of learning potential is simply not possible, on the device or even on- premise. BIDaaS means that a bank, payments provider, corporate or other organization can focus on its key strategies without the concern of data storage, hosting, maintenance or breaches. Financial institutions can now exploit the power and security of their own BIDaaS platform through easily deployable SDKs and API plug-ins.

BIDaaS means that a bank, payments provider, corporate or other organization can focus on key strategies without the concern of data storage





Users can enroll using a single device and template used across multiple channels

Ultimately, biometrics will become ever more prevalent, and not just within the financial services sector. As we move towards an increasingly mobile society and business transactions take place without face-to-face meetings, biometric identity authentication will become more and more commonplace. Organizations that use biometric authentication server-side will be able to onboard quickly and securely, minimize unnecessary friction, comply with anti-money laundering best practices and at the same time delivering a kick-ass experience.

Given the growing appetite that the general public now has for biometric authentication, BIDaaS will add the much-needed authentication of an identity alongside the existing authentication of a device. It provides that much needed inherence factor to the current factors of knowledge and possession, adding to something I have and something I know with the crucial irreplaceable factor; something I am. When a bank truly knows who its user is, they can provide the optimum experience for that person; a safer, more personalized experience across any channel, with just the right amount of friction to keep their customers' data and assets secure.

by AimBrain

Dermalog

Biometric innovations for public authorities and private businesses

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DERMALOG Identification Systems GmbH with head offices in Hamburg is Germany's pioneer for biometry and the largest German manufacturer of biometric devices and systems. DERMALOG offers a wide range of biometric identification solutions, including the latest generation of fingerprint and document scanners as well as high-performance Automatic Fingerprint Identification Systems (AFIS) and Automated Biometric Identification Systems (ABIS). The range of products is complemented by biometric border control systems, biometric ID cards, and passports as well as biometric voting systems.

Aside from Germany and Europe, DERMALOG's main markets are Asia, Africa, Latin America and the Middle East. DERMALOG technology is currently used in more than 200 large-scale installations around the globe. This includes one of the world's largest biometric installations set up in Nigeria. The branches of 23 banks and the Central Bank of Nigeria have been equipped with DERMALOG's ABIS. Bank customers are uniquely identified by fingerprints and face patterns, which effectively prevents fraud with false identities. The Nigerian banks have already successfully registered more than 32 million customers with DERMALOG's Automated Biometric Identification System.

DERMALOG's innovative solutions also provide outstanding services such as project management, installation, and customization as well as maintenance and support of the delivered products. These and additional services form the basis for a long-term and trustful cooperation that connects DERMALOG with numerous customers.



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HUMAN RECOGNITION SYSTEMS

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In 15 years, Human Recognition Systems has pioneered and driven the adoption of automated identification technology around the world, from smoothing passenger journeys in the largest airports to keeping Construction workers safe across thousands of sites and protecting major events like the 2012 Olympic Games. We continue to challenge the status quo and have built the team to make a difference.

Today, the company develops a series of industrial software and hardware systems, enabled through biometric technology, that help construction companies, airports, oil & gas facilities and other 'critical safe secure' environments operate effectively. Innovation is actively encouraged within Human Recognition Systems, approaching any situation or problem with an open and imaginative mind ensures clients that they receive a solution that best fits their requirements. Everything is approached with energy, enthusiasm and drive.

Human Recognition Systems takes pride in fulfilling potential and maximising the growth of the business as a trusted provider who deliver intelligent and bespoke solutions that are valued by their clients.



Safran Identity & Security (Morpho)

A broad range of biometric solutions and multimodal recognition for multiple business sectors

Safran Identity & Security, formerly known as Morpho, is a global leader in security and identity solutions, deploying solutions in more than 100 countries. We employ more than 8,700 people in 57 countries and generated revenues of nearly €1.9 billion in 2015. Backed by more than 40 years of experience in biometrics, the company develops innovative technologies for a wide range of markets and applications for people, governments and business. The company's solutions manage identities, secure payments and transactions and safeguard privacy, for an increasingly digital and connected world. Safran also contributes to supporting law enforcement and protecting borders, for safer and easier everyday lives.



Safran Identity & Security's broad range of biometric solutions calls on technologies such as fingerprint recognition, multimodal recognition combining fingerprints and vein patterns, facial recognition and iris recognition. It reflects our unrivaled experience in biometrics, built up over the years by providing solutions for many different sectors.

Safran Identity & Security offers different biometric solutions and components, including portable terminals, sensors, software, mobile applications and automated control gates. Virtually all of these products are designed to collect, stock and process (by comparing data) biometric information, and produce a result or authorize an action.

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Vision-Box

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The company provides end-to-end Passenger Experience and Electronic Identity Management solutions that use ICAO and NIST-compliant standards, with over 1,000 operational Automated Border Control & Passenger Experience solutions in more than 50 airports across the globe and 3,000 Identity Management solutions worldwide.

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www.accu-time.com	420 Somers Road, 06029 Ellington, CT, Usa	Tel. 1/860/870/5000	Fax 1/860/872/1511
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LEGENDA

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- MV = Machine Vision
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Julius Ltd.	**MF, SI, D -B, RFID -T (FP), SW**		
www.powertouching.com	Nezavisimost str., 7000 Rousse, Bulgaria	Tel. 359/82/887475	Fax 359/82/809019
Kee Square	**SH -B -SW**		
www.keesquare.com	Via DonaTel. lo 11, 20131 Milano, Italy	Tel. 39/02/36533368	Fax 39/02/36533329
Kronos Systems Ltd	**MF -B, C -T (FP)**		
www.kronos.com/uk	Kronos House, Carey RoaD, RG40 2NP Wokingham, UK	Tel. 44/118/9789784	Fax 44/118/9782214
Legic Identsystems AG	**MF -RFID, NFC -IC (CL, RF <HF>), R (RF), T (RF), EP**		
www.legic.com	Binzackerstrasse 41, CH-8620 Wetzikon, SWitzerland	Tel. 41/44/9336464	Fax 41/44/9336465

LEGENDA

ROLE IN THE VALUE CHAIN
- D = Distributor
- MF = Manufacturer
- SH = Software House
- SI = System Integrator
- VAR = Value Added Reseller

TECHNOLOGIES
- B = Biometrics
- BC = Barcode
- C = Cards
- DC = Data Collection
- NFC = Near Field Comm.
- RFID = Radio Frequency Identification Device
- RTLS = Real Time Loc. System

PRODUCT CATEGORIES
- A = Antenna
- C = Cards
- EP = Electronic Personalization
- GP = Graphic Personalization
- IC = Integrated Circuits
- M = Media
- MC = Machinery
- MV = Machine Vision
- P = Printers
- R = Readers
- S = Scanners
- SW = Software
- T = Terminals
- TAG = Tags
- VR = Voice Recognition

PRODUCT SPECIFICATIONS
- BT = Batch
- BC = Barcode
- CL = Contactless
- CM = Contact Memory
- CMA = Card Materials
- CP = Compact
- DNA = DNA
- EAS = Electronic Art. Surveillance
- FF = Facial Feature
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- RF = Radio Frequency
- SL = Smart Labels
- SM = Smart
- TTR = Thermal Transfer Ribbon
- UHF = Ultra High Frequency
- VF = Verifier
- VT = Vehicle Terminal

Lumidigm	**MF -B -T (FP)**		
www.lumidigm.com	801 University Blvd SE, STE 302, 87106 Albuquerque NM, Usa	Tel. 1/505/2727084	Fax 1/505/2727354
Masktech GmbH	**SH -C, B, RFID -IC, SW**		
www.masktech.com	Fischerstrasse 19, 87435 Kempten, Germany	Tel. 49/831/51210771	Fax 49/831/51210775
MaxID	**MF -RFID, B, BC -C (CL, FP, SM), TAG (RF<LF, HF, UHF>), R (HH, RF, I), S (HH, POS, OCR), T (HH, RF, FP, POS, BC)**		
www.maxidgroup.com	530 Lytton Ave. 2nd Floor, 94301 Palo Alto, Usa	Tel. 1/650/617/3370	
Morpho	**MF, SI -C, B -C (CM, SM, CL, FP), R (RF), T (RF, FP, IF, FF), SW, EP, GP**		
www.morpho.com	Le Ponant de Paris 27, rue Leblanc, F-75512 Paris Cedex 15, France	Tel. 33/1/5811/2500	Fax 33/1/4070/2550
Nadra	**VAR, SI, SH -C, B, RFID, DC -SW, EP, GP**		
www.nadra.gov.pk	State Bank of Pakistan Building, SHahrah-e-Jamhuriat, G-5/2, 44000 IslamabaD, Pakistan	Tel. 92/51/9205568	Fax 92/51/9202939
NEC Solutions (America) Inc	**SI -B -T (FP), SW**		
www.necam.com/ids/law	10850 Gold Center Drive, Suite 200, 95670 Rancho Cordova, CA, Usa	Tel. 1/800/777/2347	Fax 1/916/4637041
Nfive Software	**SH -C, BC, RFID, B -SW**		
www.nfive.com	Edificio OneWorlD, Urb Belo Horizonte Lt20, 2655-241 Ericeira, Portugal	Tel. 351/261/860450	Fax 351/261/865/647
Oki Electric Industry Co	**MF -B -P (CP), S (I), T (I, IF, FF), SW**		
www.oki.com	7-12 Toranomon 1-chome, 105-8460Tokyo, Minato-ku, Japan	Tel. 81/3/3501/3835	Fax 81/3/3501/3924
Oracle Corporation	**SH -B, RFID -SW**		
www.oracle.com	500 Oracle Parkway, 94065 Redwood Shores, CA, Usa	Tel. 1/650/506/7000	
Precise Biometrics AB	**MF -B, C -C (FP), T (FP), SW**		
www.precisebiometrics.com	Scheelevagen 19C, SE-223 70 Lund, Sweden	Tel. 46/46/311100	Fax 46/46/311101
Privaris, Inc.	**MF -B, RFID -T (FP, VF, HH, RF)**		
www.privaris.com	650 Peter Jefferson Parkway, Suite 330, 22911 Charlottesville, VA, Usa	Tel. 1/434/293/4033	Fax 1/434/293/8212
SecuGen Corporation	**MF -B -T (FP)**		
www.secugen.com	2065 Martin Ave Suite 108, 95050 Santa Clara, CA, Usa	Tel. 1/408/7277787	Fax 1/408/8347762
Smartmatic	**MF, SW -B -T (FP, VF, HH, RF), R (FO, HG, FX), S, SW**		
www.smartmatic.com	105 Piccadilly, 6th Floor, W1J 7NJ London, UK	Tel. 44/20/3402/3613	
Thales	**MF, SI -B, NFC -IC, A, T(FX, FP, IF, FF), SW, EP**		
www.thalesgroup.com	20-22 rue Grange Dame Rose, 78141 Velizi, France	Tel. 33/1/73320000	
Trix Tecnologia Ltd	**MF, SI -C, B -P, S (HH,FX), T (RF, BT, FP)**		
www.xpto.com.br	rua da Paz, 1957 Ch Sto Antônio, 04713 002 Sao Paulo, SP, Brazil	Tel. 55/11/33652000	Fax 55/11/33652070

Trüb AG	**MF, SI -C, B, NFC -C (MG, CM, SM, CL, FP), M (H), TAG (RF<LF, HF>), IC, A, P (TTR), SW, EP, GP, MC**		
www.trueb.ch	Hintere Bahnhofstrasse 12, 5001 Aarau, Switzerland	Tel. 41/62/8320000	Fax 41/62/8320100
TST Biometrics GmbH	**MF -B -T (FP)**		
www.tst-biometrics.com	Moehlstrasse 39, 81675 Munich, Germany	Tel. 49/89/9988550	Fax 49/89/99885511
Unisys	**SI, SH, VAR -C, B -C (MG,SM,OPT,FP), T (HH, FX, RF, BT, BC, FP, IF, FF, VF), VR, SW, EP, GP**		
www.unisys.com/biometrics	801 Lakeview Drive, 19422 Blue Bell, PA, Usa	Tel. 1/215/986/4011	
Vision-Box	**MF -C, B -C, R (FX, FF, FP, VF), T**		
www.vision-box.com	Rua Casal do Canas n.2, Zona Industrial de Alfragide, 2790-204 Carnaxide, Portugal	Tel. 351/21/154/3900	Fax 351/21/154/3901
Vitronic Stein Bildverarbeitungssysteme	**MF -BC, DC -R (I, OCR), S (I, OCR), MV**		
www.vitronic.com	Hasengartenstrasse 14, 65189 Wiesbaden, Germany	Tel. 49/611/71520	Fax 49/611/7152133
Vlatacom d.o.o.	**MF, SI, SH -C, B, DC -R(HH, FX,RF<HF>), S(OCR), T (HH, BC, FP, FF, RF, VF), SW, EP, GP**		
www.vlatacom.com	5 Milutina Milankovica, 11070 Belgrade, Serbia	Tel. 381/11/377/1100	Fax 381/11/377/1199
Voicevault Inc.	**SH -B -SW, VR**		
www.voicevault.com	400 Continental Blvd., 6th Floor, 90245 El Segundo, CA, Usa	Tel. 1/310/426/2792	Fax 1/310/426/2001
Voxware	**SH -B -VR**		
www.voxware.com	168 Franklin Corner Rd., 08648 Lawrenceville, NJ, Usa	Tel. 1/609/514/4100	
Wacom Europe GmbH	**MF -B -T (POS, VF), SW**		
www.wacom-europe.com	Europark Fichtenhain A9, 47807 Krefeld, Germany	Tel. 49/6966/308200	
WCC Smart Search & Match	**MF -B, DC -SW**		
www.wcc-group.com	Zonnebaan 19, 3542 EA Utrecht, The Netherlands	Tel. 31/30/7503200	Fax 31/30/7503299
Zetes BV	**SI -B, C, BC, DC, RFID, RTLS -C (SM, CL), M (L, SL, TTR, I), TAG (RF<LF, HF, UHF>), A, P (CP, I, TTR), R (HH, FX, RF, I), S (HH, FX, POS, I, OCR), T (HH, FX, RF, I, BT, BC, POS, VT, VF), VR, SW, EP**		
www.zetes.nl	Science Park Eindhoven, Ekkersrijt 5202, 5692 EG Son, The Netherlands	Tel. 31/40/8444444	Fax 31/40/8444455

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3M is fundamentally a science-based company. We produce thousands of imaginative products, and we're a leader in scores of markets - from health care and highway safety to office products and abrasives and adhesives. Our success begins with our ability to apply our technologies - often in combination - to an endless array of real-world customer needs. Of course, all of this is made possible by the people of 3M and their singular commitment to make life easier and better for people around the world. We leverage these competencies to create innovative solutions for our customers and to also provide investors with attractive long-term returns.

Radio Frequency Identification (RFID) technology from 3M ensures that books and other materials move out of the library faster. Using a self-service system and RFID, customers can check out multiple items at once, resulting in less time spent waiting in line at the self-service station or the circulation desk. RFID technology when combined with automated material handling systems, can also speed accelerate the process for getting CD, DVDs, videotapes and books—including frequently-checked-out best-sellers - back on the shelves where customers can use them. This innovative technology from 3M ensures accurate shelving of various items, eliminates frustration of searching and increases customer convenience.



Avery Dennison RFID

Creating products and solutions that solve business process challenges in diverse environments

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Flowery Branch, GA 30542
USA

Tel. +1 866 903 7343
Fax +1 770 967 5709

rfid.info@averydennison.com
www.rfid.averydennison.com

Avery Dennison RFID designs and manufactures Radio Frequency Identification (RFID) inlays. RFID Inlays include the antenna and microchip that contain the data in an RFID system - a critical link between the tagged item and the hardware, software and databases in a data collection system. Every day Avery Dennison RFID technology helps more businesses across the world reduce costs, increase sales & productivity and even improve healthcare processes to keep patients safe.

In the real-world, RFID inlays are required to perform on myriad materials and in diverse environments, many of which challenge basic RF functionality. For instance, metals cause RF waves to detune, liquids absorb RF waves and manufacturing or retail settings can be full of wireless interference. Avery Dennison RFID inlay design experts and applications engineers leverage decades of experience to create products that overcome these real-world challenges.

Avery Dennison RFID tests its inlays in simulated "real-world" environments at their RFID Technical Support Centers in Atlanta, Georgia and Luxembourg in Europe. The technical centers are fully equipped to provide real-world RFID testing, as well as consultation and training to end users, systems integrators and other companies interested in evaluating RFID solutions to solve business process challenges.



Impinj

Sensing environments to automatically adapt to new and changing conditions

Impinj is a leading world provider of UHF Gen 2 RFID solutions. Impinj draws on its technical expertise and industry partnerships to deliver a wide range of products and solutions comprising high-performance tag chips, readers, reader chips, software, antennas, and systems integration. Impinj products provide excellent performance, integration, and cost effectiveness to a global customer base, in applications across numerous vertical markets, including apparel, inventory management, asset tracking, authentication and serialization.



Among Impinj products is the Monza 4 family of RFID tag chips, which deliver privacy, performance, and memory benefits that address even the most challenging of RFID applications. The chips provide the best sensitivity combined with excellent interference rejection, support for omni-directional antennas (True3D antenna technology), innovative privacy features (QT technology), and expanded memory options.
The Impinj product line includes the Indy RFID reader chip family, based on technology acquired from Intel, and the Speedway Revolution RFID reader with Autopilot, which senses its environment, automatically configuring and adapting to new and changing conditions.

Impinj, founded in May 2000, is privately held and has raised over $110 million in funding.

701 N. 34th Street, Suite 300
Seattle, WA 98103
USA

Tel. +1 206 517 5300
Fax +1 206 517 5262

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www.impinj.com

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This expertise is used to increase security in an increasingly connected world, e.g., mobile payments, system security and secure electronic sovereign documents. Infineon has developed innovative, hardware-based security solutions for over 25 years and is now a global market leader.
With a global presence, Infineon operates through its subsidiaries in the USA from Milpitas, California, in the Asia-Pacific region from Singapore, and in Japan from Tokyo.

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85579 Neubiberg
Germany

Tel. +49 800 951951951
Fax +49 89 2349553431

www.infineon.com

3M	**MF -RFID -C (CL), M (L)**		
www.3m.com/security	Center Bldg 225-4N-14, 55144-1000 St Paul, MN, Usa	Tel. 1/800/3280067	Fax 1/800/2235563
4P Mobile Data Processing	**MF -DC, RFID, NFC -P (POS), R (HH, RF, I), S (HH, I, POS), T (HH, RF, I, BT, BC, FP, POS, VT)**		
www.4p-online.com	Via Germania 15, 35127 Padova, Italy	Tel. 39/049/8069811	Fax 39/049/8069843
ABnote	**MF -C, RFID, NFC -C (MG, CM, SM, CL, FP), M (SL), TAG (RF<HF>)**		
www.abnote.com	2200 Fletcher Avenue, 07024 Fort Lee, NJ, Usa	Tel. 1/201/592/3400	Fax 1/201/224/2762
Acig AG	**D -RFID, NFC -IC, TAG (RF<LF, HF>)**		
www.acig-ag.com	Erthalstraße 1, Bonifaziusturm B, 55118 Mainz, Germany	Tel. 49/6131/629940	Fax 49/6131/6299411
AEG Identifikationssysteme GmbH	**MF, SI -C, RFID -C (MG, CM, SM, CL, OPT), M (L, SL, TTR, I) TAG (RF<LF, HF, UHF>), IC, A, P (POS) R (HH, FX, RF, I), RF, EP, GP**		
www.aegid.de	Hörvelsinger Weg 47, 89081 Ulm, Germany	Tel. 49/7/3114/00880	Fax 49/7/3114/0088/9000
Agorabee	**MF -RFID -TAG (RF<LF, HF>), R (HH, FX, RF, MW)**		
www.agorabee.com	Avenue du 24 Janvier, 11,, CH-1020 Renens,, Switzerland,	Tel. 41/21/632/78/80	Fax 41/22/545/77/04
Alien Technology	**MF -RFID, RTLS -M (SL), TAG (RF<HF, UHF>), IC, A, R (RF, I)**		
www.alientechnology.com	18220 Butterfield Blvd, 95037 Morgan Hill, CA, Usa	Tel. 1/408/7823900	Fax 1/408/7823908
Allflex Europe (UK) Ltd	**MF, SH, SI -RFID -TAG (RF<LF>), A, R (HH, FX, RF)**		
www.allflex.co.uk	Units 6, 7, and 8 Galalaw Business Park, TD9 8PZ Hawick, UK	Tel. 44/1450/364120	Fax 44/1450/364121
ARH Inc.	**MF -B, RFID, DC, BC -BC, R (HH, FX, RF, I), S (HH, FX, POS, I, OCR), SW (S)**		
www.arhungary.hu	41. Alkotas St., HU-1123 Budapest, Hungary	Tel. 36/12019650	Fax 36/12019651
ASK	**MF -C, RFID -C (CL), M (SL), TAG (RF<HF, UHF>), P (HH), R (HH)**		
www.ask-RFID.com	2260 route des Crêtes, BP337, 06906 Sophia-Antipolis, France	Tel. 33/4/97214000	Fax 33/4/92389321
Atmel	**MF -RFID -IC (CL, RF<LF, HF, UHF, MW>)**		
www.atmel.com	2325 Orchard Parkway, 95131 San Jose, CA, Usa	Tel. 1/408/4410311	Fax 1/408/4364200
Atms plc	**SI -BC, RFID, DC -M (L, TTR), P (CP, I), R (RF), S (HH, FX), T (RF, BT, BC), SW**		
www.atmsplc.com	Number One Holt Court, Aston Science Park, B74EJ Birmingham, UK	Tel. 44/121/6289000	Fax 44/121/3594200
Avery Dennison RFID	**MF -RFID -M (SM), TAG (RF<HF, UHF>)**		
www.RFID.averydennison.com	4350 Avery Drive, 30542 Flowery Beach, GA, Usa	Tel. 1/866/903/7343	
Avonwood Development Ltd	**MF, SI, SH -RFID -TAG (RF<LF, HF, UHF, MW>), R (FX, RF, I), T (RF), SW, A**		
www.avonwood.co.uk	Knoll Technology Centre, Stapehill Road, BH217ND Wimborne, Dorset, UK	Tel. 44/1202/868000	Fax 44/1202/868001
Awid Inc	**MF -RFID -C (SM, CL), M (SL), TAG (EAS, RF<LF, HF, UHF, MW>), A, R (HH, FX, RF, I), T (HH, FX, RF, I)**		
www.awid.com	18300 Sutter Blvd., 95037 Morgan Hill, CA, Usa	Tel. 1/408/825/1100	Fax 1/408/782/7402
Axcess International, Inc	**MF, SI -RFID, C -TAG (RF), R, SW**		
www.axcessinc.com	3208 Commander Drive, 75006 Carrollton, TX, Usa	Tel. 1/972/4076080	Fax 1/972/4079085
Axiome Alpha SA	**MF -RFID, BC -S (OCR), T (HH, RF, BT, BC)**		
www.axiome.ch	Avenue Soguel 1a, 2035 Corcelles, Switzerland	Tel. 41/32/7310740	Fax 41/32/7310742

Balluff GmbH	**MF -RFID -C (CL), M (L, I), TAG (RF<LF, HF, UHF>), A, R (HH, FX, RF, I), S (OCR), SW**		
www.balluff.com	Schurwaldstrasse 9, 73765 Neuhausen, Germany	Tel. 49/7158/173195	Fax 49/7158/69154
Balogh	**MF -RFID -TAG (RF<LF, HF, UHF>), R (RF)**		
www.balogh-RFID.com	189 rue d'Aubervilliers, 75886 Paris Cedex 18, France	Tel. 33/1/4465/6500	Fax 33/1/4465/6510
Baltech AG	**MF -RFID -C (CL), M (SL), TAG (RF<HF>), A, R (HH, FX, RF, I), T (HH, RF)**		
www.baltech.de	Lilienthalstrasse 27, 85399 Hallbergmoos, Germany	Tel. 49/811/998810	Fax 49/811/9988111
Bancolini Symbol SpA	**MF, SI -BC, DC, RFID, RTLS -M (L, SL, TTR), TAG (RF<LF, HF, UHF>), A, P (CP, I, TTR), R (HH, FX, I), S (HH, FX, I), T (HH, FX, RF, I, BT, BC, VT, VF), SW**		
www.bancolini.com	via Emilia, 292, 40068 San Lazzaro di Savena, BO, Italy	Tel. 39/051/6258589	Fax 39/051/6258576
B-Id GmbH & Co., KG	**MF, D -C, RFID -C (SM, CL, OPT), TAG (RF<LF, HF>), A, R (HH)**		
www.b-id.eu	von-Seebach-str. 28, 34346 Hannoversch Münden, Germany	Tel. 49/5541/956670	Fax 49/5541/956671
Bielomatik Leuze GmbH & Co KG	**MF -RFID, NFC -MC, C (SM, CL), M (L, SL), TAGS (RF <HF, UHF, MW>, EAS), A, P (I), R (RF), EP, GP**		
www.bielomatik.com	Daimlerstrasse 6-10, 72639 Neuffen, Germany	Tel. 49/7025/120	Fax 49/7025/121117

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Brooks Automation GmbH	**MF, SI -RFID -A, R (HH, FX, RF)**		
www.brooks-RFID.com	Gartenstrasse 19, 95490 Mistelgau, Germany	Tel. 49/9279/991/550	Fax 49/9279/991/501
Caen RFID	**MF -RFID -TAG (RF<UHF>), R (HH, FX, RF, I), T (HH, POS, VT), A**		
www.caenRFID.it	Via Vetraia, 11, 55049 Viareggio, LU, Italy	Tel. 39/0584/388398	Fax 39/0584/388959
Checkpoint Systems Inc	**MF, SI, D -RFID, DC -M (SL), TAG (EAS, RF<HF, UHF>), A, R (HH, FX, RF), T (HH, RF, POS), SW**		
www.checkpointsystems.com	101 Wolf Drive, 08086 Thorofare, NJ, Usa	Tel. 1/800/2575540	Fax 1/856/3843199
Coilcraft Inc	**MF -RFID -TAG (RF<LF>)**		
www.coilcraft.com	1102 Silver Lake Road, 60013 Cary, IL, Usa	Tel. 1/847/6396400	Fax 1/847/6391469
Comercial Arqué	**VAR -C, RFID, BC -C (MG, CL), TAG (RF<HF, UHF>), A, P (I, TTR)**		
www.arque.com	Carretera del Mig. No 54, L'Hospitalet de Llobregat, 8907 Barcelona, Spain	Tel. 34/932635100	Fax 34/933372690

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Confidex Ltd.	**MF -RFID, NFC -TAG (RF<HF, UHF>, I), M (SL), C (CL)**		
www.confidex.com	Haarlankatu 1B, 33230 Tampere, Finland	Tel. 358/10/4244 100	Fax 358/10/4244 110
Databac Group	**MF, SH, SI, VAR, D -C, RFID, B -C (MG, CM, SM, CL, OPT, FP), M (L, SL, TTR, H, I), TAG (RF<HF>), P (TTR), R (HH, FX, RF), S (HH, POS), T (HH, RF, BC, FP, IF, VF), VR, SW, EP, GP**		
www.databac.com	Number One, The Ashway Centre, Elm Crescent, KT26HH Kingston, Surrey, UK	Tel. 44/208/546/9826	Fax 44/208/547126
Datacon Technology GmbH	**MF -RFID -MC**		
www.datacon.at /www.besi.com	Innstr. 16, 6241 Radfeld, Austria	Tel. 43/5337/6000	Fax 43/5337/600660
Datamars	**MF -RFID -TAG (RF<LF, HF>), A, R (HH, RF)**		
www.datamars.com	Via ai Prati, CH-6930 Bedano - Lugano, Switzerland	Tel. 41/91/9357380	Fax 41/91/9450330
Datamax O'Neil	**MF -BC, RFID -M (L, SL, TTR), P**		
www.datamax-oneil.com	4501 Parkway Commerce Boulevard, 32808 Orlando, FL, Usa	Tel. 1/800/816/9649	Fax 1/407/5788377
Datatronic Identsysteme	**MF -RFID -C (SM, CL), M (SL), TAG (RF<LF, HF, UHF>), A, P, R (HH, FX, RF, I), S (HH, FX, I), T (HH, FX, RF, I, BC, FP), SW**		
www.datatronic.eu	Dreisteinstrasse 47, 2372 Giesshuebl, Austria	Tel. 43/2236/377668/0	Fax 43/2236/377668/11
Deister Electronic	**MF -C, RFID -C (CL), TAG (RF<LF, HF, UHF>), R (HH, FX, RF, I), T (RF)**		
www.deister.com	Hermann-Bahlsen-Str. 11, 30890 Barsinghausen, Germany	Tel. 49/5105/516111	Fax 49/5105/516217
DetecTag Inc	**MF -RFID, RTLS -C (CL), M (SL), TAG (EAS, RF<LF, HF, UHF>), A, R (FX, RF, I), S (FX, POS, I), T (HH, FX, RF, I, POS)**		
www.detectag.com	16845 Highway 27, L0G 1T0 Schomberg, ON, Canada	Tel. 1/905/939/9265	Fax 1/905/939/9266
Digital Angel Corporation	**MF -RFID -TAG (RF<LF>), S (HH, FX)**		
www.digitalangel.com	490 Villaume Avenue, 55075-2443 South St. Paul, MN, Usa	Tel. 1/651/455/1621	
Digital Identification Solutions AG	**MF, SH, SI -C, B -C (CM, CL, SM, MG, OPT, FP), M (TTR, H, I), P (CP, I, TTR), EP, GP, SW, MC**		
www.digital-identification.com	Teckstrasse 52, 73734 Esslingen, Germany	Tel. 49/711/3416890	Fax 49/711/341689550
Diletta Maschinentechnik GmbH	**MF -C, RFID -C (CL), P (I), GP, EP, MC**		
www.diletta.com	Industriestrasse 25-27, 64569 Nauheim, Germany	Tel. 49/6152/18040	Fax 49/6152/180422
Dorset Identification b.v.	**MF, SI, VAR, D -RFID -C (CL), TAG (RF<LF>), A, R (HH, FX, RF, I), S (HH, FX), T (RF)**		
www.dorset.nu	Weverij 26, 7122 MS Aalten, The Netherlands	Tel. 31/543/477119	Fax 31/543/475355
Dupont Microcircuit Materials	**MF -C, RFID -C (CL)**		
www.dupont.com/mcm	Coldharbour Lane, BS16 1QD Frenchay, Bristol, UK	Tel. 44/117/9313232	Fax 44/117/9313099
Ekahau	**MF, SH -DC, RTLS -TAG (RF), SW**		
www.ekahau.com	1851 Alexander Bell Drive, 20191 Reston, VA, Usa	Tel. 1/703/860/2850	Fax 1/703/860/2028
Elatec GmbH	**MF -C, RFID -C (CM, SM, CL), M (L, SL, I), TAG (RF<LF, HF, UHF, MW>), R (HH, FX, RF, I), SW**		
www.elatec-RFID.com	Max-Planck-Str. 16, 82223 Eichenau, Germany	Tel. 49/8141/534980	Fax 49/8141/5349829
Elecsys Corporation	**MF -RFID -TAG (RF<LF>), R (RF)**		
www.extremetag.com	846 N Mart-Way Court, 66061 Olathe, KS, Usa	Tel. 1/913/647/0158	Fax 1/913/647/0123
Elektrobit Group Plc.	**MF -RFID -R (RF)**		
www.elektrobit.com	Automaatiotie 1, 90460 Oulunsalo, Finland	Tel. 358/40/344/2000	Fax 358/8/570/1301

www.sustainabledevelopmentmagazine.com

Elsag Datamat	**MF, SH, SI -C, B, RFID, DC -C (CM, SM, CL), TAG (RF<HF, UHF>), P (I), R (HH, FX, RF, I), S (POS, I, OCR), T (FP, FF), SW, GP, EP**		
www.elsagdatamat.com	Via Puccini, 2, 16154 Genova, Italy	Tel. 39/010/6582215	Fax 39/010/6512329

Elyctis	**MF, SH - C, RFID - R (RF, HH, FX, CL, OCR), SW**		
www.elyctis.fr	240 rue François Gernelle, 84120 Pertuis – France	Tel. +33 6 27 71 37 68	

EM Microelectronic Marin SA	**MF -RFID, NFC -IC (CL, CM, SM, EAS, RF<LF, HF, UHF, MW>)**		
www.emmicroelectronic.com	Rue des Sors 3, 2074 Marin, Switzerland	Tel. 41/32/7555111	Fax 41/32/7555403

EM Microelectronic is a semiconductor manufacturer specialized in the design and production of ultra-low power, low voltage integrated circuits for battery-operated and field-powered applications in consumer, automotive and industrial areas. Our product portfolio encompasses RFID, NFC, smart cards ICs, ultra-low power microcontrollers, LCD drivers, sensors, opto-electronic ICs, mixed-mode arrays and standard analog ICs. Our innovative RFID products cover all frequencies from LF to UHF, addressing all market segments.

Eter Biometric Technologies Srl	**D, VAR, SI -B, RFID -C (MG, CM, SM, CL, OPT, FP), TAG (RF<LF, HF, UHF>), R (RF), T (RF, FP, HG, IF, FF, VT), VR, SW**		
www.eter.it	Via Cartesio 3/1, 42100 Bagno, RE, Italy	Tel. 39/0522/262/500	Fax 39/0522/624/688

Etilux SA	**SI, VAR, D -BC, DC, RFID, C -C (MG), M (L, SL, TTR), TAG (RF<HF>) P (CP, I, TTR), R (HH, FX, RF, I), S (HH, FX, I), T (HH, FX, RF, I, BT, BC), SW**		
www.etilux.com	45, rue de l'Espérance, 4000 Liege, Belgium	Tel. 32/4/2249999	Fax 32/4/2261106

Euro Link Srl	**MF, SI, VAR -RFID, DC -C (SM), M (SL), TAG (RF<LF, HF, UHF>), A, R (FX, HH, I), T (RF), SW, EP**		
www.euro-link.it	V. delle Industrie, 7, 30175 Marghera, VE, Italy	Tel. 39/041/5093861	Fax 39/041/5093096

Euro Plus d.o.o. (Nice Label)	**SH -BC, RFID -SW**		
www.nicelabel.com	Poslovna cona A 2, 4208 enur, Slovenia	Tel. 386/4/280/5000	Fax 386/4/233/1148

Exceet Group	**MF -C, RFID -C (CM, CL, SM), R (HH), TAG (RF <LF, HF, UHF, MW>)**		
www.exceet.ch	Marktplatz 4, CH-9004 St. Gallen, Switzerland	Tel. 41/4179848/56	

Favite	**MF -RFID -R (HH, FX, RF, I), TAG (RF<LF, HF, UHF>)**		
www.favite.com	176, Taihe Road, 30267 Jhubei City, Hsinchu County, Taiwan	Tel. 886/3/6560300	Fax 886/3/5545982

Feig Electronic GmbH	**MF -RFID, NFC -R (HH, FX, RF, I)**		
www.feig.de	Lange Strasse 4, 35781 Weilburg, Germany	Tel. 49/6471/31090	Fax 49/6471/310999

Ferrox Tag	**MF -RFID -TAG (RF<HF>)**		
www.ferroxtag.com	Via le Brianza 20, 20092 Cinisello Balsamo (MI), Italy	Tel. 39/02/66045469	Fax 39/02/61291739

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- SM = Smart
- TTR = Thermal Transfer Ribbon
- UHF = Ultra High Frequency
- VF = Verifier
- VT = Vehicle Terminal

Fluensee	**SW, SI -RFID -SW**		
www.fluensee.com	9233 Park Meadows Drive, CO 80124 Lone Tree, Usa	Tel. 1/303/799/0700	Fax 1/303/799/0703
Generale Sistemi - Tag Italia	**VAR, SI -RFID, RTLS -TAG (RF<LF, HF, UHF, MW>), R (RF), A, EP**		
www.generalsistemi.com	Via Fra i Campi, 13C, 59012 Prato Galciana, Italy	Tel. 39/0574/816434	Fax 39/0574/815476
Giesecke & Devrient GmbH	**MF, SI -C, B, NFC, RFID -C (SM, CL, FP), M (H), IC, P (CP, I), R (FX), T (FX, BC, FP, FF), EP, GP**		
www.gi-de.com	Prinzregentenstrasse 159, 81677 Munich, Germany	Tel. 49/89/41190	Fax 49/89/41191535
GlobeRanger Corporation	**SH -RFID, RTLS -SW**		
www.globeranger.com	1130 E. Arapaho Rd, Suite 600, 75081 Richardson, TX, Usa	Tel. 1/469/330/5526	Fax 1/972/744/9988
GSI Technologies, LLC	**MF -RFID -M (SL)**		
www.graphicsolutionsinc.com	311 Shore Drive, 60527 Burr Ridge, IL, Usa	Tel. 1/630/3258181	Fax 1/630/3258197
Guangzhou XinTag Electronics Science and Technology Co. Ltd.	**MF -RFID -TAG (RF<HF>)**		
www.xintag.com	3F Section E Guangzhou Technology Innovation Base, No.80 Lan Yue Road, 510663 Guangzhou, China	Tel. 86/2038634538	Fax 86/2038634538
HID Global	**MF -C, RFID -C (MG, CM, SM, CL, OPT), M (TTR, H, I), TAG (RF, LF, UNF HF), IC, P (CP, I, TTR, POS). R (HH, FX, RF, I), SW, EP**		
www.hidglobal.com	15370 Barranca Pkwy, 92618 Irvine, CA, Usa	Tel. 1/949/732/2000	Fax 1/949/732/2120
Höft & Wessel AG	**MF -RFID, NFC, BC, DC -R (HH), S (HH, POS), T (HH, BC, POS, VT), SW**		
www.hoeft-wessel.com	Rotenburger Strasse 20, 30659 Hannover, Germany	Tel. 49/511/61020	Fax 49/511/6102/411
Honeywell Access Systems	**MF, SH -RFID, B -C (MG, CM, SM, CL, FP), M (TTR, H), P (TTR), R (HH, RF), S (HH)**		
www.honeywellaccess.com	2700 Blankenbaker Pkwy, Suite 150, 40291 Louisville, KY, Usa	Tel. 1/800/6753364	Fax 1/502/2975770
IBM United Kingdom Ltd.	**MF, SI, SH -B, RFID -T (FP, FF), SW**		
www-03.ibm.com/industries/government/	New Square, TW14 8HB Bedfont Lakes, Feltham, UK	Tel. 44/7802/461174	
ID.SYS	**D -BC, DC, C, RFID -C (MG, CM, SL, CL), M (L, SM, TTR, H, I), TAG (RF<LF, HF>), A, R (HH, FX, RF, I), S (HH, FX, POS, I, OCR), T (HH, FX, RF, I, BT, BC, POS, VT, VF), SW**		
www.idsys.es	Calle Sanchez Pacheco, 73, 28002 Madrid, Spain	Tel. 34/91/7444460	Fax 34/91/5197213
Identec Solutions AG	**MF, SI -RFID, RTLS -TAG (RF<HF, UHF, MW>), A, R (HH, FX, RF, I), T (HH, FX, RF, I, VT), SW**		
www.identecsolutions.com	Millennium Park 2, 6890 Lustenau, Austria	Tel. 43/5577/873870	Fax 43/5577/8738715
Identive Group	**MF -RFID -TAG(RF<HF, UHF>), M (SL), D – RFID, NFC – IC, TAG (RF<LF, HF>)**		
www.identive-transponders.com	Mu_hlweg 2c, 82054 Sauerlach, Germany	Tel. 49/8104/6495100	Fax 49/8104/6495110
Idesco Oy	**MF -RFID, C -C (SM, CL), TAG (RF<LF, HF>), R (RF), T (RF)**		
www.idesco.fi	Teknologiantie 9, 90570 Oulu, Finland	Tel. 358/20/74384175	Fax 358/20/7434176
IDTeck	**MF, D -C, B, RFID -C (CM, SM, CL), TAG (RF<LF, HF, UHF>), T (RF, FP, FF, VF), SW**		
www.idteck.com	5F, Ace Techno Tower B/D 684-1, Deungchon-Dong, Gangsuh-Gu, 157-030 Seoul, Korea	Tel. 82/2/26590055	Fax 82/2/6590086
iDTronic	**MF -C, RFID -C (CL), M (SL), TAG (RF<LF, HF, UHF>), R (HH, FX, RF, I), T (RF)**		
www.idtronic-group.com	Donnersbergweg 1, 67059 Ludwigshafen am Rhein, Germany	Tel. 49/621/66900940	Fax 49/621/66900949
IER	**MF, SI -RFID, DC -TAG (EAS, RF<HF, UHF>), A, M (L, SL), P (I, TTR), R (HH, FX), S (HH, POS), T (HH, FX, RF, BT, BC, VT), VR, SW**		
www.ier.fr	3, rue Salomon de Rothschild, 92156 Suresnes Cedex, France	Tel. 33/1/41386000	Fax 33/1/41386278

www.sustainabledevelopmentmagazine.com

Impinj, Inc.	**MF -RFID -IC, R(RF)**		
www.impinj.com	701 N. 34th Street, Suite 300, 98103 Seattle, WA, Usa	Tel. 1/206/517/8300	Fax 1/206/517/5262

Infineon Technologies AG	**MF -RFID, C -IC**		
www.infineon.com	Am Campeon 1-12, 85579 Neubiberg, Germany	Tel. 49/800/951951951	Fax 49/89/2349553431

Energy efficiency, mobility and security are Infineon's main focus, offering semiconductors and system solutions for automotive and industrial electronics and chip card and security applications. Infineon's products stand out for their reliability, their quality excellence and their innovative and leading-edge technology in analog and mixed signal, RF and power as well as embedded control. Based on competencies in the fields of security, contactless communication and integrated microcontroller solutions, Infineon offers a comprehensive portfolio of semiconductor-based security products for many chip card and security applications.

Inotec UK	**MF -RFID, BC -M (SL), TAG, R**		
www.inotec.info	Inotec House, Viking Close, HU10 6DZ Willerby, East Yorkshire, UK	Tel. 44/1482/654466	Fax 44/1482/655004

Inside Secure	**MF -RFID, NFC -C (CL), M (SL, L), IC**		
www.insidesecure.com	41 Parc Club du Golf, 13856 Aix en Provence, France	Tel. 33/4/42396300	Fax 33/4/42396319

Intelleflex Corporation	**MF -RFID, DC -TAG (RF<UHF>), R (HH, FX, RF), A, IC**		
www.intelleflex.com	2465 Augustine Drive #102, 95054 Santa Clara, CA, U.S.A.	Tel. 1/408/200/6500	Fax 1/408/200/6599

Intellident Ltd	**SI -BC, RFID -M (SL), TAG (RF<HF, UHF>), R (HH, FX, RF), T (BC, RF)**		
www.intellident.co.uk	Intellident House, Southgate 3, 323 Wilmslow Road, SK8 3PW Stockport, UK	Tel. 44/161/4981140	Fax 44/161/4368787

Kapsch TrafficCom AB	**MF -RFID -TAG (RF<MW>), R(FX, RF), SW**		
www.kapsch.se	Box 1063, SE-551 10 Jönköping, Sweden	Tel. 46/36/2901500	Fax 46/36/2901501

KFI Trading	**VAR, D, SI -RFID, BC, DC -M (L, TTR, SL), TAG (RF<HF, UHF>), A, P (CP, I, TTR, POS), R (HH, FX, RF, I), S (HH, FX, I, OCR), T (RF, HH, FX, I, BT, BC), VR, SW**		
www.kfi.it	Via delle Scienze, 21, 20082 Binasco (MI), Italy	Tel. 39/02/905731	Fax 39/02/90092245

Lab ID	**MF -RFID -TAG (RF<HF>), R (RF), A, C (CL), M (L, SL), SW**		
www.lab-id.com	via Corticella 11/4, 40013 Castel Maggiore, Bologna, Italy	Tel. 39/051/705941	Fax 39/051/705948

Legic Identsystems AG	**MF -RFID, NFC -IC (CL, RF <HF>), R (RF), T (RF), EP**		
www.legic.com	Binzackerstrasse 41, CH-8620 Wetzikon, Switzerland	Tel. 41/44/9336464	Fax 41/44/9336465

Lowry Computer Products Inc	**D, SI -BC, RFID, B -M (L, TTR), TAG (RF<HF, UHF>), S (HH, FX, I, POS), P (CP, TTR, I), T (RF, BT, VF)**		
www.lowrycomputer.com	9420 Maltby Road, 48116 Brighton, MI, Usa	Tel. 1/810/2297200	Fax 1/810/2295189

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Lux-Ident s.r.o.	**MF -RFID -TAG (RF<LF, HF>)**		
www.lux-ident.com	Tovární 368, 56301 Lan_kroun, Czech Republic	Tel. 420/465/352/500	Fax 420/465/352/501
Lyngsoe Systems A/S	**MF, SH, SI -BC, DC, C, RFID, RTLS -C (SM), M (L), TAG (RF<LF, HF, UHF>), IC, A, P, R (HH, FX, I), S (POS), T (BT, VT, VF), SW**		
www.lyngsoesystems.com	Lyngso Allé 3, 9600 Aars, Denmark	Tel. 45/96980980	Fax 45/96980980
Magellan Technology Pty Ltd	**MF -RFID -M(SL), TAG (RF<HF>), IC, R (FX, RF), A**		
www.magellan-technology.com	65, Johnston St, NSW 2038 Annandale, Sydney, Australia	Tel. 61/2/9562/9800	Fax 61/2/9518/7620
Manhattan Associates	**SH -RFID -VR, SW**		
www.manh.com	2300 Windy Ridge Parkway, 7th Floor, 30339 Atlanta, GA, Usa	Tel. 1/770/9557070	Fax 1/770/9550302
MaxID	**MF -RFID, B, BC -C (CL, FP, SM), TAG (RF<LF, HF, UHF>), R (HH, RF, I), S (HH, POS, OCR), T (HH, RF, FP, POS, BC)**		
www.maxidgroup.com	530 Lytton Ave. 2nd Floor, 94301 Palo Alto, Usa	Tel. 1/650/617/3370	
MCF RFTech Srl	**MF, SH -C, NFC -C (CL), TAG (RF<HF>), A, R (RF), T (RF, POS), SW**		
www.mcfgroup.com	Via Roma, 3, 28069 Sozzago (NO), Italy	Tel. 39/0321/700008	Fax 39/0321/700010
Melzer maschinenbau GmbH	**MF -C, RFID -MC, C (MG, CM, SM, CL), M (L, SL), TAG (MK, RF<LF, HF, UHF, MW>)**		
www.melzergmbh.com	Ruhrstr 51-55, 58332 Schwelm, Germany	Tel. 49/2336/9292/80	Fax 49/2336/9292/85
Microlise	**MF, SH -DC, RFID, RTLS -R (RF), T (VT, RF), SW, VR**		
www.microlise.com	Farrington Way, Eastwood, NG16 3AG Nottingham, UK	Tel. 44/1773/537000	Fax 44/1773/537373
Microsensys GmbH	**MF -RFID -TAG (RF<HF, UHF>), R (RF)**		
www.microsensys.de	Office Park im GVZ, In der Hochstedter Ecke 2, 99098 Erfurt, Germany	Tel. 49/361/598740	Fax 49/361/5987417
Microsoft Corporation	**SH -C, B, RFID, DC -SW**		
www.microsoft.com	One Microsoft Way, 98052-6399 Redmond, WA, Usa	Tel. 1/800/642/7676	Fax 1/425/936/7329
Motorola Solutions	**MF -RFID, BC -A, R (HH, FX, RF, I), S (HH, FX, POS, I), T (HH, FX, RF, I, BT, BC, POS, VT), SW**		
www.motorolasolutions.com	1303 East Algonquin Road, 60196 Schaumburg, IL, Usa	Tel. 1/847/5765000	
MRFID	**MF -RFID -C (CL), TAG (RF<LF, HF, UHF, MW>), R (RF), SW, T (RF), A**		
www.mRFID.it	Via Arno, 36, 80126 Napoli, Italy	Tel. 39/081/646983	Fax 39/081/3606901
Mühlbauer Group	**MF, SH, SI -RFID, C -C, M (SL), TAG (MK, RF), P (CP, I, TTR), T (FX, RF, I, BT, FP, IF, FF, VF), SW, EP, GP, MC, MV**		
www.muehlbauer.de	Josef-Muehlbauer-Platz 1, 93426 Roding, Germany	Tel. 49/9461/9520	Fax 49/9461/9521101
Murata	**MF -RFID -IC, TAG (RF<UHF>)**		
www.murata.com	2200 Lake Park Drive, 30080-7604 Smyrna, GA, Usa	Tel. 1/800/241/6574	
Nagra ID	**MF -C, RFID -C (MG, CM, SM, CL), M (L, TTR, H, I), TAG (RF<LF, HF, UHF>), EP, GP**		
www.nagraid.com	Crêt du Locle 10, 2301 La Chaux-de-Fonds, Switzerland	Tel. 41/32/9240404	Fax 41/32/9240400
NCR Corporation	**MF, D -RFID, BC -M (L, SL, TTR), P (I, TTR), S (FX, POS)**		
www.ncr.com	1700 South Patterson Blvd, 45479 Dayton, OH, Usa	Tel. 1/888/979/8627	Fax 1/888/449/2349
Nedap AVI	**MF, SI -RFID -TAG (RF<LF, HF, UHF>), R (RF), T (RF)**		
www.nedapavi.com>	Parallelweg 2e, 7141 DC Groenlo, The Netherlands	Tel. 31/544/471111	Fax 31/544/464255

Nexperts	**SH -NFC, RFID -SW, T (HH, RF), TAG (RF:HF), R (HH, RF)**		
www.nexperts.com	Software Park 37, A-4232 Hagenberg, Austria	Tel. 43/7236/33514610	Fax 43/7236/33514699
Niceware International	**SH -BC -SW, M (L)**		
www.nicewareintl.com	10437 Innovation Drive, Suite 225, 53226 Milwaukee, WI, Usa	Tel. 1/414/4766423	Fax 1/414/4767955
Nordic ID	**MF -RFID, BC, DC -R (RF<UHF>, HH), T (HH, RF, BC, BT, POS)**		
www.nordicid.com	Myllyojankatu 2A, 24100 Salo, Finland	Tel. 358/2/7277700	Fax 358/2/7277720
NXP Semiconductors	**MF -RFID, NFC -IC (RF<LF, HF, UHF, MW>, CM, SM, CL, R)**		
www.nxp.com/identification	Mikron-Weg 1, A-8101 Gratkorn, Austria	Tel. 43/31/24299990	Fax 43/31/24299270
OATSystems	**SH -RFID -SW**		
www.oatsystems.com	309 Waverley Oaks Road, Suite 306, 02452 Waltham, MA, Usa	Tel. 1/781/907/6100	Fax 1/781/907/6098
Odin	**SI -RFID -SW**		
www.odintechnologies.com	22960 Shaw Road, Suite 600, 20166 Dulles, VA, Usa	Tel. 1/703/968/0000	Fax 1/703/456/0148
Oltremare Srl	**SH, SI, D -DC, RFID, BC, C, B -C (MG, CL), TAG (RF<LF, MW>), R (HH, FX, RF), S (HH), T (HH, FX, RF, BT, BC, HG), SW**		
www.oltremare.net	Via del Gelso 7, 33100 Udine, UD, Italy	Tel. 39/0432/508988	Fax 39/0432/204121
Omnia Technologies	**MF -RFID, C -TAG (RF<LF, HF, UHF>)**		
www.omniatags.com	Plot No. 68, Sector - 5, IMT Manesar, 122050 Gurgaon, Haryana, India	Tel. 91/124/4366411	Fax 91/1244366410
Omni-ID	**MF -RFID -TAG (RF<UHF>)**		
www.omni-id.com	1065 East Hillsdale Boulevard, Suite 400, 94404 Foster City, CA, Usa	Tel. 1/650/571/6664	
Omron Corporation	**MF -RFID -M (L), TAG (RF), A, R (RF), T (RF)**		
www.ia.omron.com	Shiokoji Horikawa, Shimogyo-Ku, 600-8530 Kyoto, Kyoto, Japan	Tel. 81/75/344/7173	Fax 81/77/344/7149
Oracle Corporation	**SH -B, RFID -SW**		
www.oracle.com	500 Oracle Parkway, 94065 Redwood Shores, CA, Usa	Tel. 1/650/506/7000	
Panmobil	**MF -RFID, BC, DC -R (HH, RF, I)**		
www.panmobil.com	Hansestr. 91, 51149 Köln, Germany	Tel. 49/2203/10334777	Fax 49/2203/10334720
Parlex	**MF -C, RFID -C (SM, CL), M (L, SL), TAG (RF<HF, UHF>), A**		
www.parlex.com	Taylor Road, PO30 5LG Newport, Isle of Wight, UK	Tel. 44/1983/526535	Fax 44/1983/524964

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TECHNOLOGIES
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- SL = Smart Labels
- SM = Smart
- TTR = Thermal Transfer Ribbon
- UHF = Ultra High Frequency
- VF = Verifier
- VT = Vehicle Terminal

PartItalia	**MF, SI -RFID -C (CL), M (SL), IC, A, TAG (RF<LF, HF, UHF>), R (RF), T (RF, POS)**		
www.partitalia.com	largo S. D'Aquisto, 7, 20020 Lainate (MI), Italy	Tel. 39/029372413	Fax 39/02/93796611
PAV Card GmbH	**MF -C, RFID -C (MG, CM, SM, CL), EP, GP, TAG (RF<HF>), M**		
www.pavcard.de	Hamburger Strasse 6, 22952 Luetjensee, Germany	Tel. 49/4154/7990	Fax 49/4154/799151
Pepperl und Fuchs Gmbh	**MF -RFID -R (RF, I), T(RF), SW**		
www.pepperl-fuchs.com	Koenigsberger Allee, 87, 68307 Mannheim, Germany	Tel. 49/621/7760	Fax 49/621/7761000
Planet ID	**MF - RFID -R (HH), SW, TAG**		
www.planet-id.com	Hauptstr. 5-9, D-45219 Essen – Germany	Tel. +49/2054/939650	Fax 2054/9396519

Planet ID offers a wide range of products and on top of this we have put our focus on the development of user-friendly and competent solutions. Managed by a veterinarian, our products are developed by professionals for professionals. Our core business is electronic animal identification and we are also experienced in the industrial RFID field: consulting on government level as well as realization of logistics and traceability for industrial productions. We are flexible, quick and reliable – just ask our customers.

Pluriservice SpA	**MF, D, SI -BC, RFID -M (L, TTR), P (CP, I), S (HH, FX, I), T (RF, BT, VT), SW**		
www.pluriservice.it	via Grandi, 5 - Z.I. Bassette, 48100 Ravenna, RV, Italy	Tel. 39/544/456669	Fax 39/544/688954
PowerID Ltd.	**MF -RFID, RTLS -TAG (RF<UHF>), R (RF)**		
www.power-id.com	21 Yegia Kapaim St., 49130 Kiryat Arye, Petah Tikva, Israel	Tel. 972/3/9204200	Fax 972/3/9204222
Precision Dynamics Corporation	**MF -RFID, BC -C (CL, SM), M (L, SL), TAG (MK, RF<HF, UHF>)**		
www.pdcorp.com	27770 N Entertainment Dr. Suite #200, 91355 Valencia, CA, Usa	Tel. 1/661/257/0233	Fax 1/818/899/4045
Psion Teklogix	**MF -BC, DC, RFID -R (HH, RF, I), S (OCR), T (FX, BT, VT), P, VR**		
www.psion.com	2100 Meadowvale Blvd, L5N 7J9 Mississauga, ON, Canada	Tel. 1/905/813/9900	Fax 1/905/812/6275
RedPrairie	**SI -RFID -SW**		
www.redprairie.com	20700 Swenson Drive, 53186 Waukesha, WI, Usa	Tel. 1/262/317/2000	Fax 1/262/317/2001
Reva Systems	**MF -RFID -N/A**		
www.revasystems.com	100 Apollo Drive, 01824 Chelmsford, MA, Usa	Tel. 1/9782440010	Fax 1/9782440055
RF Code	**MF -RFID -TAG (RF), R (RF), SW**		
www.rfcode.com	9229 Waterford Centre Blvd., Suite 500, 78758 Austin, TX, Usa	Tel. 1/512/439/2200	Fax 1/512/439/2199
RF IDeas Inc	**MF -RFID, NFC -C (MG, CM, SM, CL), TAG (RF<LF, HF>), R (RF)**		
www.RFIDeas.com	4020 Winnetka Ave, 60008 Rolling Meadows, IL, Usa	Tel. 1/847/8701723	Fax 1/847/4831129
RFID Inc	**MF -RFID, NFC, RTLS -C (CL), TAG (RF<LF, HF, UHF>), IC, A, R (HH, FX, RF, I), T (HH, FX, RF, I)**		
www.RFIDinc.com	14190 E. Jewell Avenue, Suite 4, 80012-5678 Aurora, CO, Usa	Tel. 1/303/3661234	Fax 1/303/3661222
RFID Technologies CC	**MF -RFID -TAG (RF<UHF>), R (RF), SW**		
www.rf-id-systems.com	236 Regent Street East, Observatory, 2198 Johannesburg, Gauteng, South Africa	Tel. 27/10/237/0675	Fax 27/86/617/8002
RF-iT Solutions GmbH	**SH -RFID -SW**		
www.rf-it-solutions.com	Hans-Resel-Gasse 17a, 8020 Graz, Austria	Tel. 43/316/7111110	Fax 43/316/711111/900

ruhlamat GmbH	**MF - C, RFID - A, C(CL), EP (MK), GP, MC**		
www.ruhlamat.com	Sonnenacker 2, 99819 Marksuhl, Germany	Tel. 49/369259290	Fax 49/36925929111

ruhlamat is an innovative engineering and machine building company with its headquarters located in Germany. Activities are focused on smart card and passport processing technology, e.g. passport production and personalization, card production and personalization, module preparation as well as Inlay/RFID solutions and special machinery. ruhlamat branches and representations throughout the world create an ideal basis for a professional and area-spanning service network.

Sato Corporation	**MF -RFID, DC -M (L), TAG (RF<LF, HF, UHF>), P (CP, I, TTR), SW**		
www.sato.co.jp	21-3, Ebisu 1-chome, 150-0013 Shibuya-ku, Tokyo, Japan	Tel. 81/3/54494401	Fax 81/3/38644464
Savi Technology	**MF, SH -RFID -TAG (RF), R (RF), SW**		
www.savi.com	351 East Evelyn Ave., 94041 Mountain View, CA, Usa	Tel. 1/408/7438000	Fax 1/408/5438650
Scemtec Transponder Technology Gmbh	**MF -RFID -TAG (RF<LF, HF, UHF>), R (HH, FX, RF, I), T (RF), SW**		
www.scemtec.com	Gewerbeparkstrasse 20, 51580 Reichshof-Wehnrath, Germany	Tel. 49/2265/9960	Fax 49/2265/996-699
Schreiner LogiData	**MF -C, RFID, BC -C (SM, CL), M(L, SL, I), TAG (RF<HF, UHF>)**		
www.schreiner-logidata.com	Bruckmannring 22, 85764 Oberschleissheim, Germany	Tel. 49/89/31584/4140	Fax 49/89/31584/4109
SCM Microsystems (Identiv)	**MF -RFID, NFC -R (HH, FX, RF), T (HH, FX, RF)**		
www.scmmicro.com	Oskar-Messter-Straße 13, 85737 Ismaning, Germany	Tel. 49/89/9595/5000	Fax 49/89/9595/5555
Seeburger	**SI, SH -RFID -SW**		
www.seeburger.com	Edisonstrasse 1, 75015 Bretten, BW, Germany	Tel. 49/7252/960	Fax 49/7252/962222
Selectamark Security Systems Plc	**MF, D -RFID, BC -TAG (MK, DNA, RF<LF, UHF>), R (HH, FX)**		
www.selectamark.co.uk	1 Locks Court, 429 Crofton Rd, BR6 8NL Locksbottom, Kent, UK	Tel. 44/1689/860757	Fax 44/1689/860693
Selex Elsag	**MF, SH, SI -C, B, RFID, DC -C (CM, SM, CL), TAG (RF<HF, UHF>), P (I), R (HH, FX, RF, I), S (POS, I, OCR), T (FP, FF), SW, GP, EP**		
www.selexelsag.com	Via Puccini, 2, 16154 Genova, Italy	Tel. 39/010/65821	Fax 39/010/6512898
Sinel Systems	**MF, D -BC, DC, RFID -M (L, SL, TTR, H, I), TAG (RF), P (CP, I, TTR), R (HH, FX, I), S (HH, FX, I), T (HH, FX, RF, I, BT, BC), SW**		
www.sinel.com	Adva. Castell de Barbera, 37-41. Centro Ind. Santiga, 08210 Barbera del Valles (Barcelona), Spain	Tel. 34/93/745/2100	Fax 34/93/745/2101
Sirit Inc	**MF -RFID -TAG (RF<UHF>), A, R (FX, RF), T (RF)**		
www.sirit.com	372 Bay Street, Suite 1100, M5H 2W9 Toronto, Ontario, Canada	Tel. 1/4163671897	Fax 1/4163671435

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Skidata AG	**MF, D, SI -C, RFID -C (SM, CL, OPT, MG), M (L, TTR), TAG (RF<LF, HF>), P (CP, TTR), R (HH, FX, RF), S (HH, FX, POS), SW, T (HH, FX, BC, POS, VT)**		
www.skidata.com	Unterbergstrasse 40, 5083 Grödig - Salzburg, Austria	Tel. 43/6246/8880	Fax 43/6246/8887
SkyeTek	**MF -RFID, C -R (HH, FX, RF, I), SW, A**		
www.skyetek.com	11030 Circle Point Road, Suite 300, 80020 Westminster, CO, Usa	Tel. 1/720/5650441	Fax 1/720/5658989
Smartrac Technology GmbH	**MF -RFID, NFC -TAG (RF<LF, HF, UHF>), A, M (SL), C (CL)**		
www.smartrac-group.com	Albstrasse 14, 70597 Stuttgart, Germany	Tel. 49/711/656/92610	Fax 49/711/656/92611
Smartware	**MF -C, RFID -EP, GP, R (RF)**		
www.smartware.fr	11, Avenue des Andes, Le Carthagène, Z.A. de Courtaboeuf, 91940 Les Ulis, France	Tel. 33/1/6486/2525	Fax 33/1/6486/2526
Socket Mobile	**MF -BC, DC, RFID -R (HH, RF,), S (HH, POS), T (HH, RF, BC, POS), SW**		
www.socketmobile.com	39700 Eureka Drive, 94560 Newark, CA, Usa	Tel. 1/510/9333000	Fax 1/510/93330307
Spartanics	**MF -C, RFID -C (MG, CM, SM), M (L), P (I)**		
www.spartanics.com	3605 Edison Place, 60008 Rolling Meadows, IL, Usa	Tel. 1/847/3945700	Fax 1/847/3940409
STMicroelectronics	**MF -C, RFID, B -C (CM, SM, CL, FP), M (SL), TAG (RF<HF, UHF>), IC**		
www.st.com	39, Chemin du Champ des Filles CP 21, 1228 Plan-Les-Ouates, Geneva 15, Switzerland	Tel. 41/22/9292929	Fax 41/22/929/2900
Studio Card Ltd.	**SI, VAR, D -C, RFID -C (CL, SM), M, TAG (RF<LF, HF>), R (RF), T (RF)**		
www.RFID.bg	36, Dragan Tsankov Blvd., Interpred World Trade Centre, Office B 324, 1040 Sofia, Bulgaria	Tel. 359/886/718545	Fax 359/2/9693330
TAGnology	**MF -RFID, RTLS -C (CL), TAG (RF<MW>), A, R (HH, FX, RF, I), T (HH, RF), SW**		
www.tagnology.com	Grazer Vorstadt 142, A-8570 Voitsberg, Austria	Tel. 43/3142/289/2817	Fax 43/3142/289/2820
The Tag Factory	**MF, RFiD, TAG (RF<LF, HF, UHF>)**		
www.thetagfactory.com	Bisonlaan 3, 5691 GC Son, The Neherlands	Tel. 31/653940020	

The Tag Factory (TTF) is a manufacturer of High Quality RFiD tags at very competitive pricing for a wide range of Tracking&Tracing and Assetmanagement projects. With 180 employees TTF produces RFiD tags in LF/HF/UHF frequencies and has more than 100 standard tags in the productrange. Reading distance up to 18m with UHF passive on metal tags. ATEX/ex certified tags for oil&gas applications. Sales through a worldwide authorized System Integrators network. Small quantities can be ordered at the website for evaluation.

Tagstar Systems GmbH	**MF -RFID -TAG (RF<HF, UHF>), M (SL)**		
www.tagstar-systems.de	Mühlweg 2c, 82054 Sauerlach, Germany	Tel. 49/8104/649510	Fax 49/8104/649511
Tagsys RFID	**MF -RFID -M (L, SL), TAG (EAS, MK, RF<HF, UHF>), A, R (HH, FX, RF, I), T (HH, FX, RF, I, POS), SW**		
www.tagsysRFID.com	785 Voie Antiope - ZI Athélia III, 13600 La Ciotat, France	Tel. 33/4/4218/8900	Fax 33/4/4218/8901
Take Supply Chain	**SH -RFID, DC, BC -SW, TAG (RF), M (L, SL), T (BC, RF, HH, VR)**		
www.takesupplychain.com	6805 Capital of Texas Hwy - Suite 370, 78731 Austin, Texas, Usa	Tel. 1/512/2318191	Fax 1/512/2310292
Texas Instruments RFID Systems	**MF -RFID, C -C (CL), M (SL), TAG (RF<LF, HF, UHF>), IC, A, R (HH, FX, RF), T (RF), SW**		
www.ti-RFID.com	6550 Chase Oaks Blvd, 75023 Plano, TX, Usa	Tel. 1/800/962/7343	Fax 1/214/567/7343
Tharo Systems Inc	**MF, SH, D -BC, RFID -M (L, TTR), P (CP, I, TTR), SW, MC**		
www.tharo.com	2866 Nationwide Parkway, P. O. Box 798, 44212-0798 Brunswick, OH, Usa	Tel. 1/330/2734408	Fax 1/330/2250099

ThingMagic, Inc.	**MF, SI -RFID, RTLS -A, TAG, T (HH, FX), R (HH, FX), SW**		
www.thingmagic.com	One Broadway, 5th Floor, 02142 Cambridge, MA, Usa	Tel. 1/866/833/4069	Fax 1/617/225/4410
Toshiba TEC Europe RIS	**MF -BC, RFID -M (TTR), TAG (RF<UHF, MW>), P (CP, I, TTR), T (BC, POS), SW**		
www.toshibatec-eu.com	Rue de la Célidée 33, Celideestraat 33, 1080 Brussels, Belgium	Tel. 32/2/4102100	Fax 32/2/4107987
Transcore	**MF, SI -RFID -TAG (RF<UHF, MW>), R (HH, FX), SW**		
www.transcore.com	8158 Adams Drive, Liberty Centre - Bldg. 200, 17036 Hummelstown, PA, Usa	Tel. 1/717/561/2400	Fax 1/717/564/8439
Trolley Scan (Pty) Ltd	**MF -RFID, RTLS -TAG (RF<UHF>), R (RF)**		
www.trolleyscan.com	P.O.Box 59227, 2100 Kengray, Johannesburg, South Africa	Tel. 27/10/2370675	Fax 27/866/178002
Trovan Ltd.	**MF -RFID -TAG (RF<LF>), R(RF), T(RF), SW, C(CL), IC, A**		
www.trovan.com	Gruenguertelstr 12, D-50996 Koeln, Germany	Tel. 49/221/3911203	Fax 49/221/395893
Two Technologies, Inc.	**MF -DC, RFID -T (HH, RF, I, BC, BT)**		
www.2T.com	419 Sargon Way, 19044 Horsham, PA, Usa	Tel. 1/215/4415305	Fax 1/215/4410423
Ubisense	**MF -RTLS -TAG(RF), A, R, SW**		
www.ubisense.net	90 St. Andrews Road, CB4 1DL Cambridge, UK	Tel. 44/1223/535170	Fax 44 /1223/535167
Videojet Technologies Inc	**MF -BC -TAG (MK), M (L, TTR), P (I, TTR)**		
www.videojet.com	1500 Mittel Blvd, 60191-1073 Wood Dale, IL, Usa	Tel. 1/630/8607300	Fax 1/630/800/582/1343
Wavetrend UK Ltd	**MF -RFID -TAG (RF), R (RF)**		
www.wavetrend.net	Parkshot House, 5 Kew Road, TW9 2PR Richmond, Surrey, UK	Tel. 44/208/334/8400	Fax 44/208/334/8401
Wincor Nixdorf International GmbH	**MF, SH, SI -RFID, C -T (HH, FX, RF, BC, POS, VF), R (HH, FX, POS), SW, P (CP)**		
www.wincor-nixdorf.com	Heinz-Nixdorf-Ring 1, 33106 Paderborn, Germany	Tel. 49/5251/69330	Fax 49/5251/6936767
Wisteq Oy	**MF -RFID -TAG (RF<HF, UHF>), C (CL)**		
www.wisteq.com	Salvesenintie 6, 40420 Jyväskylä, Finland	Tel. 358/40/5047963	
Xerafy Ltd.	**MF -RFID -TAG (RF<UHF>)**		
www.xerafy.com	Lippo Center Tower II, Unit 3709, 89 Queensway, Admiralty,, Hong Kong	Tel. 86/139/1727/0931	
Zucchetti Axess TMC SpA	**MF -BC, C, RFID, B, DC -C (MG, CL, FP), R (HH), T (BC, FP)**		
www.axesstmc.com	Via della Filanda, 22, 40133 Bologna, BO, Italy	Tel. 39/051/3519311	Fax 39/051/3519399

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Honeywell Scanning and Mobility

Offering broad product portfolio in the automatic identification and data collection industry

Honeywell

700 Visions Drive
P.O. Box 208
Skaneateles Falls, NY, 13153-0208 – USA

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www.honeywell.com

Honeywell Scanning & Mobility (HSM) is a leading manufacturer of high-performance image- and laser-based data collection hardware, including rugged mobile computers and bar code scanners, radio frequency identification solutions, voice-enabled workflow and printing solutions. With the broadest product portfolio in the automatic identification and data collection industry, HSM provides data collection hardware for retail, healthcare, and transportation and logistics companies seeking to improve operations and enhance customer service. Additionally, HSM provides advanced software, service and professional solutions that help customers effectively manage data and assets.

Honeywell Global Tracking (an SBE of Honeywell Scanning & Mobility) develops products and solutions that are used around the world to track, monitor and communicate with mobile assets. Honeywell International is a versified technology and manufacturing leader, serving customers worldwide with aerospace products and services; control technologies for buildings, homes and industry; automotive products; turbochargers; and performance materials.



Motorola

Advancing the way the world connects through cutting-edge, converged solutions

MOTOROLA

1303 East Algonquin Road
Schaumburg, IL 60196
USA

Tel. +1 847 576 5000

www.motorola.com

Motorola is a global communications leader powered by a passion to invent and an unceasing commitment to advancing the way the world connects. Motorola's Enterprise Mobility Solutions and Networks business offers a comprehensive end-to-end portfolio of products and solutions, including rugged two-way radios, mobile computers, secure public safety systems, barcode scanning, RFID readers and wireless network infrastructure to enterprises and governments, as well as 4G broadband infrastructure, devices and services to network operators globally.

The Enterprise Mobility Solutions (EMS) portfolio is available to enterprise customers across retail, energy and utilities, transportation, manufacturing, healthcare and other commercial markets and to governments and public safety agencies. Motorola EMS has consistently delivered new ways for governments and businesses to connect from the first ever two-way radio and the first ever hand held laser scanner to the cutting-edge, converged solutions of today such as the mobile computing device, MC9500, and the APX public safety radio. With this portfolio Motorola offers solutions, support tools and services to many of the Fortune 500 companies and governments around the world. Combined with a global channel partner community Motorola has an extensive reach into small-to-medium businesses, as well a large range of additional vertical markets.



Scandit

Delivering fast, accurate full-screen and any-angle scanning for logistics businesses

Scandit enables retail, manufacturing and logistics businesses to maximize operational performance and drive new revenue streams via enterprise-grade barcode scanning, OCR and data capture software for smartphones, tablets and wearable devices. With over 10,000 licensees in over 80 countries, Scandit's award-winning mobile scan technology and associated cloud services is the platform of choice for many of the world's most prestigious brands including Ahold, Saks 5th Avenue, Capital One, Homeplus (Tesco), Nasa, Bayer and Coop, empowering consumers and employee use cases ranging from self-scanning, mobile shopping and mobile point of sale to inventory management and asset tracking.



Scandit's cross-platform scan technology delivers lightning-fast and highly accurate full-screen and any-angle scanning, even of blurry and damaged barcodes, on the widest possible range of iOS and Android devices, and provides seamless support for IBM Worklight, Adobe Phonegap, Xamarin and Appcelerator Titanium. Founded in 2009 by a group of researchers from MIT, ETH Zurich and IBM Research, today Scandit and its network of global integration and technology partners are pushing the boundaries of mobile AIDC (automatic identification and data capture) and developments in the 'Internet of Things' arena to deliver ground-breaking identification and data capture applications to its global customer base.

Scandit

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info@scandit.com

Zebra Technologies

Location systems that give a virtual voice to an organization's assets, people and transactions

A global leader respected for innovation and reliability, Zebra Technologies offers technologies that give a virtual voice to an organization's assets, people and transactions, enabling organizations to unlock greater business value. The company's extensive portfolio of marking and printing technologies, including RFID and real-time location solutions, illuminates mission-critical information to help customers take smarter business actions.

Whether tracking containers and cargo through a major port, managing parts for lean manufacturing or managing ground support equipment at a major airport, the automated asset tracking and management solutions from ZES improve business processes. Utilizing the combined products offered by these businesses, ZES provides greater asset visibility and business efficiency for the aerospace and defense, aviation, automotive, industrial manufacturing, maritime, and transportation and logistics industries.



Customers within these industries benefit by increasing productivity, lowering operational costs, and improving safety and security throughout their logistics operations.

ZEBRA TECHNOLOGIES

475 Half Day Road
Suite 500
Lincolnshire, IL 60069
USA

Tel. +1 847 634 6700
Fax +1 847 913 8766

www.zebra.com

4P Mobile Data Processing	**MF -DC, RFID, NFC -P (POS), R (HH, RF, I), S (HH, I, POS), T (HH, RF, I, BT, BC, FP, POS, VT)**		
www.4p-online.com	Via Germania 15, 35127 Padova, Italy	Tel. 39/049/8069811	Fax 39/049/8069843
A2B Tracking Solutions Inc	**SH, SI -BC, DC -R (HH, RF, I), S (HH), SW**		
www.a2btracking.com	207 High Point Avenue, 02871 Portsmouth, RI, Usa	Tel. 1/401/683/5215	Fax 1/401/683/5219
Access-IS	**MF -C, RFID – R (OCR, RF, CL, BC), DC – R (OCR, RF, CL, BC), BC -R (RF, CL, POS)**		
www.access-is.com	18 Suttons Business Park, Reading, Berkshire, RG6 1AZ, United Kingdom	Tel. +44 7748 770 632	Fax +44 118 926 7281
Advanco SA	**SI -BC, B -M (L, TTR), P (CP, I), S (HH, FX), T (RF, BT, FF)**		
www.advanco.be	Rue de la Fusée 66, B-1130 Brussels, Belgium	Tel. 32/2/7268800	Fax 32/2/7264039
Alp Vision	**SH, SI - C, DC - SW, M (MK, VF)**		
www.alpvision.com	Rue du clos 12, 1800 Vevey, Switzerland	Tel. +41 21 948 6464	
Altronix SE, Lda	**SI, D -BC, DC, C, RFID, B -C (MG, CM, CL, FP, SM), M (L, TTR), TAG (EAS), P (CP, I), R (HH, FX, RF), S (POS), T, SW**		
www.altronix.pt	Rua de Santana, 963 C - S.19, 4465 742 Leça do Balio, Portugal	Tel. 35/1229066060	Fax 35/1229066069
Arca Etichette SpA	**MF -BC -M (L, TTR), P (I)**		
www.arca.it	via Edison, 119, 20010 Marcallo, MI, Italy	Tel. 39/2/972311	Fax 39/2/9761633
Armor SA	**MF -BC, DC -M (TTR), P (TTR)**		
www.armor-tt.com	20, rue Chevreul - BP 90508, 44105 Nantes Cedex 4, France	Tel. 33/2/40384000	Fax 33/2/40384018
Atms plc	**SI -BC, RFID, DC -M (L, TTR), P (CP,I), R (RF), S (HH, FX), T (RF, BT, BC), SW**		
www.atmsplc.com	Number One Holt Court, Aston Science Park, B7 4EJ Birmingham, UK	Tel. 44/121/6289000	Fax 44/121/3594200
Axicon Auto ID Ltd	**MF -BC -S(HH, FX), P(I, CP)**		
www.axicon.com	Church Road, Weston-on-the-Green, Bicester, OX25 3QP Oxford , UK	Tel. 44/1869/351155	Fax 44/1869/351205
Axiome Alpha SA	**MF -RFID, BC -S (OCR), T (HH, RF, BT, BC)**		
www.axiome.ch	Avenue Soguel 1a, 2035 Corcelles, Switzerland	Tel. 41/32/7310740	Fax 41/32/7310742
Bancolini Symbol SpA	**MF,SI -BC,DC,RFID,RTLS -M (L,SL,TTR),TAG (RF<LF,HF,UHF>),A,P (CP,I,TTR),R (HH,FX,I),S (HH,FX,I),T (HH,FX,RF,I,BT,BC,VT,VF),SW**		
www.bancolini.com	via Emilia, 292, 40068 San Lazzaro di Savena, BO, Italy	Tel. 39/051/6258589	Fax 39/051/6258576
Baracoda SA	**MF -BC -S (HH), T (BC), SW**		
www.baracoda.com	30 Avenue de l'Amiral Lemonnier, 78160 Marly-Le-Roi, France	Tel. 33/1/30088900	Fax 33/1/30088998
BB Data Teknik A/S	**SI -BC, DC -S (HH, FX, I), T (HH, FX, I, BC, VT)**		
www.bbdata.dk	Transformervej 18, 2730 Herlev, Denmark	Tel. 45/44/850230	Fax 45/44/531507
Brady Corporation	**MF -BC, DC -M (L), SW, P (C, TTR)**		
www.bradyid.com	6555 W Good Hope Rd, 53223 Milwaukee, WI, Usa	Tel. 1/414/3586600	Fax 1/414/358/6647
CAB	**MF, BC, P, SW, BC, L, TTR**		
www.cab.de	Wilhelm-Schickard-Str.14, 76131 Karlsruhe, Deutschland	Tel. 49/721/6626-281	Fax 49/721/6626-229

Label Printing Systems - Print and Apply – Marking Laser, Series of label printers, Barcode printer, Half and fully automatic labeling systems Label dispenser, Marking laser, Consumables / Ribbon and Labels - Label software, cab is setting new technological benchmarks in developing and manufacturing devices and systems for product labeling and product marking. Customers from the manufacturing, service industries and trade rely on our high quality standards.

Casio Europe GmbH	**MF -BC, DC, NFC -S (HH, I, OCR), T (HH, RF, I, BT, BC, VT), NFC**		
www.casio-b2b.com	Casio-Platz 1, 22848 Norderstedt, Schleswig-Holstein, Germany	Tel. 49/40/52865/407	Fax 49/40/52865/424
Checkpoint Systems Inc	**MF, SI, D -RFID, DC -M (SL), TAG (EAS, RF<HF, UHF>), A, R (HH, FX, RF), T (HH, RF, POS), SW**		
www.checkpointsystems.com	101 Wolf Drive, 08086 Thorofare, NJ, Usa	Tel. 1/800/2575540	Fax 1/856/3843199
Cils	**MF -BC -M (L, I)**		
www.cils-international.com	2 Southdownview, Broadwater B. Park, BN14 8NL Worthing, West Sussex, UK	Tel. 44/1903/219000	Fax 44/1903/219111
Citizen Systems Europe	**MF -BC -M (L, TTR), P (CP, I, TTR, POS), SW**		
www.citizen-europe.com	Park House, 643-651 Staines Road, TW14 8PA Feltham, Middlesex, UK	Tel. 44/20/8893/1900	Fax 44/20/8893/0080
Code Corporation	**MF -BC, DC -R(HH, I), T(HH, I, BT, BC)**		
www.codecorp.com	11814 South Election Road, Suite 200, 84020 Draper, UT, Usa	Tel. 1/801/4952200	Fax 1/801/4952202
Cognex Corporation	**MF -DC, BC -MV**		
www.cognex.com	One Vision Drive, 01760-2059 Natick, MA, U.S.A.	Tel. 1/508/650/3000	Fax 1/508/650/3333
Compact Laser Solutions GmbH	**MF -BC, C -TAG (MK), MC**		
www.compactlaser.com	Berliner Strasse 27, 13507 Berlin, Germany	Tel. 49/30/2355540	Fax 49/30/23555444
Conver Autoadhesivos SA	**MF -BC -P (I, CP), M (L, TTR)**		
www.conver-autoadhesivos.com	Avda. Puigcerda, 14, 08185 Llica de Vall, Barcelona, Spain	Tel. 34/93/8491866	Fax 34/93/8463870
Dai Nippon Printing Co Ltd	**MF -BC -M (TTR)**		
www.dnpribbons.com	2F, Ichigaya Sankyo Bldg., 14-1 Haraikatacho, 162-0841 Shinjuku-ku, Tokyo, Japan	Tel. 81/3/3266/4210	Fax 81/3/3266/4224
Dap Technologies	**MF -BC, DC -T (RF, HH, BC, FP, IF, VT)**		
www.daptech.com	25 Nuffield Way, OX14 1RL Abingdon, UK	Tel. 44/1235/462130	Fax 44/1235/462131
Datalogic SpA	**MF, SI -DC, BC -R (HH, FX, RF, I), S (HH, FX, POS, I, OCR), T (HH, FX, RF, I, BT, BC, POS, VT)**		
www.datalogic.com	Via Candini 2, 40012 Lippo di Calderara, BO, Italy	Tel. 39/051/3147011	Fax 39/051/726562
Datamax O'Neil	**MF -BC, RFID -M (L, SL, TTR), P**		
www.datamax-oneil.com	4501 Parkway Commerce Boulevard, 32808 Orlando, FL, Usa	Tel. 1/800/816/9649	Fax 1/407/5788377
Dynic Usa Corporation	**MF -BC -M (L, TTR)**		
www.dynic.com	4750 NE Dawson Creek Dr., 97124 Hillsboro, OR, Usa	Tel. 1/503/6931070	Fax 1/503/6481185

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- RF = Radio Frequency
- SL = Smart Labels
- SM = Smart
- TTR = Thermal Transfer Ribbon
- UHF = Ultra High Frequency
- VF = Verifier
- VT = Vehicle Terminal

Ekahau	**MF, SH -DC, RTLS -TAG (RF), SW**		
www.ekahau.com	1851 Alexander Bell Drive, 20191 Reston, VA, Usa	Tel. 1/703/860/2850	Fax 1/703/860/2028
Etilux SA	**SI,VAR, D -BC, DC, RFID, C -C (MG), M (L, SL, TTR), TAG (RF<HF>) P (CP, I, TTR), R (HH, FX, RF, I), S (HH, FX, I), T (HH, FX, RF, I, BT, BC), SW**		
www.etilux.com	45, rue de l'Espérance, 4000 Liege, Belgium	Tel. 32/4/2249999	Fax 32/4/2261106
Euro Link Srl	**MF, SI, VAR -RFID, DC -C (SM), M (SL), TAG (RF<LF, HF, UHF>), A, R (FX, HH, I), T (RF), SW, EP**		
www.euro-link.it	V. delle Industrie, 7, 30175 Marghera, VE, Italy	Tel. 39/041/5093861	Fax 39/041/5093096
Euro Plus d.o.o. (Nice Label)	**SH -BC, RFID -SW**		
www.nicelabel.com	Poslovna cona A 2 , 4208 _en_ur, Slovenia	Tel. 386/4/280/5000	Fax 386/4/233/1148
Flytech Technology Co Ltd	**MF -BC, RTLS, DC -R (HH), S (HH, POS)**		
www.flytech.com.tw	No. 168, Sing-Ai Rd., Nei-Hu District 114, 114 Taipei, Taiwan, Republic of China	Tel. 886/2/8791/4988	Fax 886/2/8791/4966
Foba Laser Marking + Engraving (Alltech)	**MF -C, DC -MC, TAG (MK), MV**		
www.fobalaser.com	An der Trave 27-31, 23923 Selmsdorf, Germany	Tel. 49/38823/550	Fax 49/38823/55222
Genesta	**MF, SI -RFID, DC -R (RF), A, SW**		
www.genesta.com/syvox	1850 Interstate 30, 75087 Rockwall, Texas, Usa	Tel. 1/972/7711653	Fax 1/972/7221179
Grape Systems Inc	**SH -DC, BC -SW**		
www.grape.co.jp	Queen's Tower B 19F, 2-3-3 Minato-mirai, Nishi-ku, 220-6119 Yokohama, Kanagawa, Japan	Tel. 81/45/2223761	Fax 81/45/2223760
Höft & Wessel AG	**MF -RFID, NFC, BC, DC -R (HH), S (HH, POS), T (HH, BC, POS, VT), SW**		
www.hoeft-wessel.com	Rotenburger Strasse 20, 30659 Hannover, Germany	Tel. 49/511/61020	Fax 49/511/6102/411
Honeywell Scanning and Mobility	**MF -DC, BC -R (HH, FX, RF, I), S (HH, FX, POS, I, OCR), T (HH, FX, RF, I, BC, POS, VT, VF)**		
www.honeywellaidc.com	700 Visions Drive, 13153-0208 Skaneateles Falls, NY, Usa	Tel. 1/315/5546000	Fax 1/315/6850049
ID.SYS	**D -BC, DC, C, RFID -C (MG, CM, SL, CL), M (L, SM, TTR, H, I), TAG (RF<LF, HF>), A, R (HH, FX, RF, I), S (HH, FX, POS, I, OCR), T (HH, FX, RF, I, BT, BC, POS, VT, VF), SW**		
www.idsys.es	Calle Sanchez Pacheco, 73, 28002 Madrid, Spain	Tel. 34/91/7444460	Fax 34/91/5197213
Identec Solutions AG	**MF, SI -RFID, RTLS -TAG (RF<HF, UHF, MW>), A, R (HH, FX, RF, I), T (HH, FX, RF, I, VT), SW**		
www.identecsolutions.com	Millennium Park 2, 6890 Lustenau, Austria	Tel. 43/5577/873870	Fax 43/5577/8738715
Identicus Slovenia D.O.O.	**VAR -BC -S(HH, FX), P(I, CP), PT(RF, BT), M(L, TTR)**		
www.identicus.si	Slandrova ulica 8b, 1000 Ljubljana, Slovenia	Tel. 386/61/5890170	Fax 386/61/5890180
Iimak	**MF -BC -M (TTR)**		
www.iimak.com	310 Commerce Drive, 14228 Amherst, NY, Usa	Tel. 1/716/691633	Fax 1/716/6913395
ImageID Ltd	**SH, D -DC, BC -R (FX, I), SW, MV**		
www.imageid.com	1 Hanagar St, Neve Ne'eman B, PO Box 7252, 45241 Hod Hasharon, Israel	Tel. 972/9/7774200	Fax 972/9/7774222
Infineon Technologies AG	**MF -RFID, C -IC**		
www.infineon.com	Am Campeon 1-12, 85579 Neubiberg, Germany	Tel. 49/800/951951951	Fax 49/89/2349553431
Informa Oy	**SI -BC -M (L, TTR), P (CP, I), S (HH, FX, I), T (RF, BC, BT)**		
www.informa.fi	Ruukintie 20.B, 02330 Espoo, Finland	Tel. 358/424/22001	Fax 358/424/2200300

Inotec UK	**MF -RFID, BC -M (SL), TAG, R**		
www.inotec.info	Inotec House, Viking Close, HU10 6DZ Willerby, East Yorkshire, UK	Tel. 44/1482/654466	Fax 44/1482/655004
Inspection Systems Inc	**MF -BC -VF**		
www.inspectionsystems.com	7351 Kirkwood Lane N, Ste 122, 55369 Minneapolis, MN, Usa	Tel. 1/763/3158060	Fax 1/763/3158066
Intelleflex Corporation	**MF -RFID, DC -TAG (RF<UHF>), R (HH, FX, RF), A, IC**		
www.intelleflex.com	2465 Augustine Drive #102, 95054 Santa Clara, CA, U.S.A.	Tel. 1/408/200/6500	Fax 1/408/200/6599
Intellident Ltd	**SI -BC, RFID -M (SL), TAG (RF<HF, UHF>), R (HH, FX, RF), T (BC, RF)**		
www.intellident.co.uk	Intellident House, Southgate 3, 323 Wilmslow Road, SK8 3PW Stockport, UK	Tel. 44/161/4981140	Fax 44/161/4368787
Intelligent Instrumentation	**MF, SI -BC, DC -A, R (FX, RF, I), S (HH, I), T (FX, RF, I, BT, BC, VT), SW, MV**		
www.lanpoint.com	6440 S. Bonney Ave., 85706 Tucson, AZ, Usa	Tel. 1/520/5730887	Fax 1/520/5730522
KFI Trading	**VAR, D, SI -RFID, BC, DC -M (L, TTR, SL), TAG (RF<HF, UHF>), A, P (CP, I, TTR, POS), R (HH, FX, RF, I), S (HH, FX, I, OCR), T (RF, HH, FX, I, BT, BC), VR, SW**		
www.kfi.it	Via delle Scienze, 21, 20082 Binasco (MI), Italy	Tel. 39/02/905731	Fax 39/02/90092245
Klimax A/S	**SI -BC -M (L, TTR), P (CP, I)**		
www.klimax.dk	Literbuen 12 - 14, 2740 Skovlunde , Denmark	Tel. 45/7022/1071	Fax 45/44/945388
Labau Technology Corporation	**MF -BC, C -R (HH, FX), P (CP, TTR), S (FX), T (POS)**		
www.labau.com.tw	3F-3, No 125, Ln 235, Bau Chiau Road, 231 Taipei, Taiwan	Tel. 886/2/89191371	Fax 886/2/89191771
Label Vision Systems Inc	**MF -BC -S (FX, I, OCR, HH), T (BC, VF), MV**		
www.lvs-inc.com	101 Auburn Court, 30269 Peachtree City, GA, Usa	Tel. 1/770/4876414	Fax 1/770/4870860
Labelmate LLC	**MF -BC -MC**		
www.Labelmate.com	69 Avenue Alphonse XIII, 1180 Brussels, Belgium	Tel. 32/2/3756960	Fax 32/2/3753896
Linikodas UAB	**D -BC -S (HH,FX), M (L)**		
www.linikodas.lt	Savanoriu av. 187, bldg. 2, 02300 Vilnius, Lithuania	Tel. 370/5/2323040	Fax 370/5/2323038
Linkspoint	**MF -BC, DC, RTLS -SW**		
www.linkspoint.com	One Selleck Street - Suite 330, 06855 Norwalk, CT, Usa	Tel. 1/203/8534600	Fax 1/413/4734600
Logicode PTE Ltd	**D -BC, C, RFID -S (HH, FX), R (RF), P, T (RF, BT, BC)**		
www.logicode.com.sg	10 Ubi Crescent #05-28, 408564 Ubi Techpark (Lobby B), Singapore	Tel. 65/64588/337	Fax 65/64588/553

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Lowry Computer Products Inc	**D, SI -BC, RFID, B -M (L, TTR), TAG (RF<HF,UHF>), S (HH, FX, I, POS), P (CP, TTR, I), T (RF, BT, VF)**		
www.lowrycomputer.com	9420 Maltby Road, 48116 Brighton, MI, Usa	Tel. 1/810/2297200	Fax 1/810/2295189
Lyngsoe Systems A/S	**MF, SH, SI -BC, DC, C, RFID, RTLS -C (SM), M (L), TAG (RF<LF, HF, UHF>), IC, A, P, R (HH, FX, I), S (POS), T (BT, VT, VF), SW**		
www.lyngsoesystems.com	Lyngso Allé 3, 9600 Aars, Denmark	Tel. 45/96980980	Fax 45/96980980
Maxa Technologies	**D -DC, BC -M (L, TTR,), P (CP, I, TTR. POS) R (HH,FX), S (HH, FX, POS, I, OCR), T (HH, FX, RF, BC, POS)**		
www.maxatec-europe.com	Atlantic Street, WA14 5QJ Altrincham, Cheshire, UK	Tel. 44/161/9427850	Fax 44/161/9277664
Mecco Marketing and Traceability	**MF -DC, BC -TAG (MK), S (HH, FX), T (HH, FX, I, BT, BC, VF), SW, MC**		
www.mecco.com	290 Executive Drive, Suite 200, 16066 Cranberry Twp, PA, Usa	Tel. 1/888/369/9190	Fax 1/724/779/9556
Meteor Srl	**MF, SI -BC, RFID -S (HH, FX, I, POS), P, T (RF, BT), M (L, TTR)**		
www.meteorbarcode.it	via delle Macchine, 24, 30038 Spinea, VE, Italy	Tel. 39/041/5412600	Fax 39/041/5412231
Microlise	**MF, SH -DC, RFID, RTLS -R (RF), T (VT, RF), SW, VR**		
www.microlise.com	Farrington Way, Eastwood, NG16 3AG Nottingham, UK	Tel. 44/1773/537000	Fax 44/1773/537373
Microscan	**MF -BC, DC -S (FX, I, HH, OCR), R (FX, I, HH), SW, MV**		
www.microscan.com	700 SW 39th Street, 98057 Renton, WA, USA	Tel. 1/425/2265700	Fax 1/425/2268250
Microvision Inc	**MF -BC -S (HH, FX, I)**		
www.mvis.com	19910 North Creek Parkway, 98011 Bothell, WA, Usa	Tel. 1/425/4156847	Fax 1/425/4156603
Motorola Solutions	**MF -RFID, BC -A, R (HH, FX, RF, I), S (HH, FX, POS, I), T (HH, FX, RF, I, BT, BC, POS, VT), SW**		
www.motorolasolutions.com	1303 East Algonquin Road, 60196 Schaumburg, IL, Usa	Tel. 1/847/5765000	
Multiscan Corporation	**MF -BC -R (FX, I)**		
http://multiscan-corp.com/english/index.html	1110 Brickell Ave, Suite 502, 33131 Miami, FL, Usa	Tel. 1/305/3738007	Fax 1/305/3738058
NCR Corporation	**MF, D -RFID, BC -M (L, SL, TTR), P (I, TTR), S (FX, POS)**		
www.ncr.com	1700 South Patterson Blvd, 45479 Dayton, OH, Usa	Tel. 1/888/979/8627	Fax 1/888/449/2349

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Niceware International	**SH -BC -SW, M (L)**		
www.nicewareintl.com	10437 Innovation Drive, Suite 225, 53226 Milwaukee, WI, Usa	Tel. 1/414/4766423	Fax 1/414/4767955
Nordic ID	**MF -RFID, BC, DC -R (RF<UHF>, HH), T (HH, RF, BC, BT, POS)**		
www.nordicid.com	Myllyojankatu 2A, 24100 Salo, Finland	Tel. 358/2/7277700	Fax 358/2/7277720
Oltremare Srl	**SH, SI, D -DC, RFID, BC, C, B -C (MG, CL), TAG (RF<LF, MW>), R (HH, FX, RF), S (HH), T (HH, FX, RF, BT, BC, HG), SW**		
www.oltremare.net	Via del Gelso 7, 33100 Udine, UD, Italy	Tel. 39/0432/508988	Fax 39/0432/204121
Opticon Ltd	**MF -BC, DC -T (HH, RF, BT, BC), R (HH, FX, POS, I)**		
www.opticon.com	960 Capability Green, LU1 3PE Luton, Bedfordshire, UK	Tel. 44/1582/635100	Fax 44/1582/635200

Oribi id-solutions	**SH -B, DC -C (FP), S (RF, HH, OCR), SW**		
www.oribi.nl	Bedrijfsweg 15, 5061 JX Oisterwijk, The Netherlands	Tel. 31/135211256	Fax 31/135287137
Panmobil	**MF -RFID, BC, DC -R (HH, RF, I)**		
www.panmobil.com	Hansestr. 91, 51149 Köln, Germany	Tel. 49/2203/10334777	Fax 49/2203/10334720
Pathguide Technology Inc	**SH, SI -BC -SW**		
www.pathguide.com	8221 - 44th Ave. Suite G, 98275 Mukilteo, WA, Usa	Tel. 1/888/6279797	Fax 1/425/4382799
Pluriservice SpA	**MF, D, SI -BC, RFID -M (L, TTR), P (CP, I), S (HH, FX, I), T (RF, BT, VT), SW**		
www.pluriservice.it	via Grandi, 5 - Z.I. Bassette, 48100 Ravenna, RV, Italy	Tel. 39/544/456669	Fax 39/544/688954
Precision Dynamics Corporation	**MF -RFID, BC -C (CL, SM), M (L, SL), TAG (MK, RF<HF, UHF>)**		
www.pdcorp.com	27770 N Entertainment Dr. Suite #200, 91355 Valencia, CA, Usa	Tel. 1/661/257/0233	Fax 1/818/899/4045
Printronix Inc	**MF -BC -P (CP, I)**		
www.printronix.com	14600 Myford Road, 92623 Irvine, CA, Usa	Tel. 1/714/3682300	Fax 1/714/3682600
Psion Teklogix	**MF -BC, DC, RFID -R (HH, RF, I), S (OCR), T (FX, BT, VT), P, VR**		
www.psion.com	2100 Meadowvale Blvd, L5N 7J9 Mississauga, ON, Canada	Tel. 1/905/813/9900	Fax 1/905/812/6275
RF Code	**MF -RFID -TAG (RF), R (RF), SW**		
www.rfcode.com	9229 Waterford Centre Blvd., Suite 500, 78758 Austin, TX, Usa	Tel. 1/512/439/2200	Fax 1/512/439/2199
Ricoh Company Ltd	**MF -BC -M (L, TTR)**		
www.ricoh.com	13-1, Ginza 8-chome, 104-8222 Chuo-ku, Tokyo, Japan	Tel. 81/3/6278/2111	Fax 81/3/6278/2997
Sato Corporation	**MF -RFID, DC -M (L), TAG (RF<LF, HF, UHF>), P (CP, I, TTR), SW**		
www.sato.co.jp	21-3, Ebisu 1-chome, 150-0013 Shibuya-ku, Tokyo, Japan	Tel. 81/3/54494401	Fax 81/3/38644464
Savi Technology	**MF, SH -RFID -TAG (RF), R (RF), SW**		
www.savi.com	351 East Evelyn Ave. , 94041 Mountain View, CA, Usa	Tel. 1/408/7438000	Fax 1/408/5438650
Scandit	**MF, SH -BC, DC - S, R (BC, HH, I, OCR, OPT, POS, SM), MV, SW**		
www.scandit.com	Thurwiesenstrasse 8, 8037 Zurich, Switzerland	Tel. 41/44/586/4540	Fax 1/617/284/6565

LEGENDA

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- VF = Verifier
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Scansource Inc	**D -BC, RFID -S (HH, FX/I/POS), P (I, CP), T (RF, BT), M (L, TTR)**		
www.scansource.com	6 Logue Ct, 29615 Greenville, SC, Usa	Tel. 1/864/2882432	Fax 1/864/2885515
Scemtec Transponder Technology Gmbh	**MF -RFID -TAG (RF<LF, HF, UHF>), R (HH, FX, RF, I), T (RF), SW**		
www.scemtec.com	Gewerbeparkstrasse 20, 51580 Reichshof-Wehnrath, Germany	Tel. 49/2265/9960	Fax 49/2265/996-699
Seagull Scientific Inc	**SH -BC, RFID -SW**		
www.seagullscientific.com	1616 148th Avenue SE, 98007 Bellevue, WA, Usa	Tel. 1/425/6411408	Fax 1/425/6411599
Selectamark Security Systems Plc	**MF, D -RFID, BC -TAG (MK, DNA, RF<LF, UHF>), R (HH, FX)**		
www.selectamark.co.uk	1 Locks Court, 429 Crofton Rd, BR6 8NL Locksbottom, Kent, UK	Tel. 44/1689/860757	Fax 44/1689/860693
Sick AG	**MF -BC, RFID -R (RF), S (HH, FX, I)**		
www.sick.com	Erwin-Sick-Str. 1, 79183 Waldkirch, Germany	Tel. 49/7681/2020	Fax 49/7681/202/3863
Sinel Systems	**MF, D -BC, DC, RFID -M (L, SL, TTR, H, I), TAG (RF), P (CP, I, TTR), R (HH, FX, I), S (HH, FX, I), T (HH, FX, RF, I, BT, BC), SW**		
www.sinel.com	Adva. Castell de Barbera, 37-41. Centro Ind. Santiga, 08210 Barbera del Valles (Barcelona), Spain	Tel. 34/93/745/2100	Fax 34/93/745/2101
SkyeTek	**MF -RFID, C -R (HH, FX, RF, I), SW, A**		
www.skyetek.com	11030 Circle Point Road, Suite 300, 80020 Westminster, CO, Usa	Tel. 1/720/5650441	Fax 1/720/5658989
Socket Mobile	**MF -BC, DC, RFID -R (HH, RF,), S (HH, POS), T (HH, RF, BC, POS), SW**		
www.socketmobile.com	39700 Eureka Drive, 94560 Newark , CA, Usa	Tel. 1/510/9333000	Fax 1/510/93330307
Szzt Electronics Group	**MF -C, DC -C (MG, SM), R, P, T (HH, BC, POS), SW, EP, GP**		
www.szzt.com	5/F, West Coast Bldg, Nan You Rd, 518054 Nan Shan District, Shenzhen, Guangdong, China	Tel. 86/755/26490094	Fax 86/755/26490099
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Teklynx International	**SH -BC, DC -T (BC), SW**		
www.teklynx.eu	Chemin de Naréoux, 32000 Auch, France	Tel. 33/562/601080	Fax 33/562/601089
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ToP Tunniste Oy	**SI, VAR, D -DC, RFID -C (CL), M (SL), TAG (RF <HF, UHF>), A, P (TTR), R (HH, FX, RF), T (HH, FX, RF), EP, GP, SW**		
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Toshiba TEC Europe RIS	**MF -BC, RFID -M (TTR), TAG (RF<UHF, MW>), P (CP, I, TTR), T (BC, POS), SW**		
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Unitech Electronics Co Ltd	**MF -BC, DC -T (BC, BT)**		
www.unitech.com.tw	3Fl., No. 236, Shinhu 2nd Rd., Neihu Chiu, 114 Taipei, Taiwan	Tel. 886/2/2796/2345	Fax 886/2/8791/9608
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WiseKey	**MF, SH - C, DC - T (VF), SW**		
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www.zetes.nl	Science Park Eindhoven, Ekkersrijt 5202, 5692 EG Son, The Netherlands	Tel. 31/40/8444444	Fax 31/40/8444455
Zucchetti Axess TMC SpA	**MF -BC, C, RFID, B, DC -C (MG, CL, FP), R (HH), T (BC, FP)**		
www.axesstmc.com	Via della Filanda, 22, 40133 Bologna, BO, Italy	Tel. 39/051/3519311	Fax 39/051/3519399

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