



## Press Background Information

In 2004, a team of advanced signal processing and deep space telecommunications scientists and engineers led by Dr. Ramin Sadr formed Mojix® Inc with the vision of applying the technical breakthroughs in deep space communications to the commercial wireless infrastructure industry. The result is a commercial passive RFID reader system with capabilities orders of magnitude beyond previous RFID reader offerings, and a new generation of RFID system technology that eliminates the economic and technical barriers to large-scale, high-volume RFID deployment to deliver on the full promise of RFID.

### Quick Facts

Founded in 2004, venture funded in 2005  
\$22.5 million in venture funding  
40+ employees

### Mojix Milestones

June 2006 – Proof-of-concept  
August 2006 – Field trial of alpha system  
December 2006 – Field trials of beta system  
Q3 2007 – Customer field trials

### Products: The Mojix STAR™ System

The first offering powered by this new technology, the fully FCC- and EPC Gen 2-compliant Mojix STAR system, delivers breakthrough functionality across multiple dimensions, providing:

- 100,000 times the receiver sensitivity of previous solutions—50db link budget improvement
- More than 20 times the range of conventional RFID readers—more than 600 feet/182 meters
- More than 100 times greater coverage area than conventional systems—up to 250,000sq feet/76,200sq meters with one STAR system
- Verification of 99.9% of tags on RF-challenged materials
- Expanded utility of passive RFID—location estimation, security and authentication

These breakthroughs are the result of new signal processing technology perfected in deep space applications to detect extremely faint signals, combined with innovative new systems architecture and rich reader management capabilities. Together they make it possible to economically deploy RFID in immensely large contiguous spaces and across multiple, simultaneous, real-time business processes with unprecedented levels of accuracy, reliability and scalability.

### Economic Breakthrough for RFID

The leaps in functionality delivered by the Mojix STAR system enable organizations to advance far beyond today's isolated RFID read points and achieve genuine RFID ubiquity in an economical manner—taking passive RFID to “pervasive RFID.” For the first time, they are able to leverage one system to address all auto-identification needs, from presence detection to precision location tracking to security and authentication. They can deploy a single system to read and verify all RFID tags across entire retail location, massive warehouse or outdoor yard, with a single point of management, non line of sight read capabilities, and a reliable read rate

exceeding 99.9 percent for excited tags. And they can quickly and cost-effective scale the system to accommodate increases in tag density, coverage area or concurrent activities and applications. These advantages and more are enticing organizations to take a fresh look at the business benefits of RFID, propelling the industry forward as they make passive RFID not just viable for many more applications, but the enabler of new generations of applications to come.

### **Mojix STAR System Architecture**

A Mojix STAR system consists of one or more STAR receivers managing up to 512 low-cost Mojix eNode transmitters that are oriented to define the system's three dimensional coverage area. In decoupling the tag detection/reading function from the tag exciting function, this innovative, distributed excitation architecture helps enable the STAR system's huge coverage area and economical scalability.

- Mojix eNodes – Each Mojix eNode excites all passive RFID tags within its designated interrogation space to a range of up to 30 feet.
- STAR receiver – The centralized, high-sensitivity STAR receiver picks up and processes tag signals from anywhere within an up to 250,000 sq foot coverage area, with non line of sight read capability
- STAR interrogation spaces – Fixed or mobile STAR interrogation spaces are business process-specific and can be optimized for tag density or coverage. Each individually controlled interrogation space is created by the deployment of single or multiple eNodes and is dynamically sized by the STAR system, which controls each node's power output.

### **Customers and Markets**

The Mojix STAR system enables implementation of highly cost-effective and reliable RFID systems for supply chain, asset tracking and security applications across multiple industries. Mojix field trial customers include Fortune 50 innovators in supply chain management within the consumer packed goods and retail segments. Other major markets able to benefit from the advances of the Mojix STAR system include DoD supply chain, transportation, manufacturing, construction, healthcare, and media and entertainment.

### **Use Cases**

- Dock door operations—ability to cover dozens of dock doors with a single system, with non-line of sight reads, security and precise location determination.
- Inventory management—ability to engage in perpetual real-time inventory tracking and replenishment
- Item level tracking—ability to accurately track individual items on a truly massive scale
- Manufacturing and WIP—brings benefits of low-cost passive RFID to asset tracking and WIP
- Yard management—enables lower cost, scaleable solution.

Security—enables virtual fencing, shrinkage control, brand authentication, product safety, and counterfeiting protection

### **Company History**

Founded in 2004 by a team of entrepreneurs and scientists with expertise in deep space communications, Mojix, Inc. has its roots deep in the U.S. Space Program. Beginning in the 1980s, Mojix founder and CEO Dr. Ramin Sadr led the close-knit team in solving some of the toughest communications challenges concerning deep space probes—from creating the ground terminals for NASA's deep space network (DSN), which regularly tracks spacecrafts venturing inside or outside the solar system, to the all-digital receiver model for the present day receivers deployed by NASA. One of these challenging missions was salvaging telemetry data from the Galileo spacecraft mission from the ground when the craft's high gain antenna failed to deploy upon reaching Jupiter. Many in this core team continued to innovate with Dr. Sadr as he later started and led several successful high tech companies built around his inventions in telephony and wireless communications.

In 2001, Dr. Sadr began formulating the mathematics behind what would become the Mojix STAR system. The idea was to develop technology that would create value for large enterprises, and that would fuse the team's deep space communications expertise with concepts formulated decades ago by great visionaries in communications theory such as Shannon. The initial focus for this work was on software defined radios (SDR) based on new nonlinear digital signal processing techniques that tap spacetime. In 2002, Dr Sadr teamed up with Mr. Tom Huseby, a seasoned executive and venture capitalist to incubate and calibrate Mojix's business plan. Together, Dr Sadr and Mr. Huseby formulated the present business plan for Mojix Inc. This SDR technology enabled multiple breakthroughs for Mojix with a roadmap to offer the ultimate cognitive packet radio systems for sensory networks, as well as intelligence for signal sorting and analysis, all applied to the commercial RFID industry.

Mojix incorporated in August of 2003. After spending two years developing Mojix's technology and business plan, in September of 2005, Mojix received funding from InnoCal and Red Rock Ventures, and started working towards a proof of concept with a team that grew to include 15 PhDs, each expert in their respective fields ranging from antenna, RF circuit, digital hardware and real time software and operating system design and implementation. Most team members had collaborated with Dr. Sadr in past ventures and all possessed vast experience building complex systems, with industrial telecommunications grade performance. After initial funding in September of 2005, the team worked relentlessly to deliver the proof of concept for the Mojix STAR product in May 2006. Subsequently Mojix demonstrated this early model to a leading consumer packaged goods company in October of 2006, reading a population of RFID tags at a distance of 800 feet. This was a pivotal moment for the industry, the first time in history that a passive RFID tag was read at such a distance.

In early trials in 2006, customers were astounded at what they were seeing—passive RFID tags read from more than 1000 feet away, from the extreme end of a warehouse. It was the commercial pay-off of work culminated by Dr. Sadr and his associates almost more than a decade before in detecting very weak signals from deep space probes, across vast distances in the Milky Way. The ultimate solution for reading RFID tags, receiving signals with triple nine reliability over these distances positioned Mojix to improve the state of art in RFID reader technology by an astonishing factor of x100,000 fold improvement in receiving capability.

Series B funding was completed in mid-2007 with the lead investor Oak Investment Partners. In 2007, Mojix completed its senior management team with the addition of executives with years of experience in business development, marketing and sales in the RFID, telecommunications, wireless and consumer product goods sectors.

The Mojix STAR system debuts publicly in April 2008, following extensive customer field trials with Fortune 50 innovators in consumer packaged goods and retailing. A giant step for RFID, the Mojix STAR is the first step in a revolution in the way people and businesses will use sensors and RFID tags (pieces of wireless memory), dispersed spatially and across time to drive a host of previously unthinkable applications.

### **Mojix Management Team**

#### *Dr. Ramin Sadr, Founder & CEO*

Telecommunications industry visionary, entrepreneur, researcher and executive. Holds 15 achievement awards from NASA for contributions to the US space program, and launched and led several successful high tech businesses based on his own technology innovations. Held positions with Jet Propulsion Laboratory, IBM and Boeing. Holds Ph.D. in electrical engineering and computer science, UCLA.

#### *Kevin Duffy, SVP Sales & Marketing*

Networking and communications industry executive with vast experience in addressing emerging markets, monetizing advanced technologies, and targeting large enterprise customers. Held

positions with Proxim (CEO), Siemens and Northern Telecom. Holds BS Computer Science degree, University of Texas, USAF.

*Shawn Manesh, SVP Operations*

Telecommunications, wireless and computer industry senior executive. Twenty years experience with private and public companies in managing business strategy, operations, business development and supply chain management. Holds BS Engineering degree, CSUN and MBA degree, Pepperdine University

*Dr. John Gevargiz, VP Engineering*

Telecommunications industry veteran in research, development, and management. Extensive experience in leading large engineering teams. Held positions with Boeing Satellite Systems, Ikanos Communications, GTE Laboratories, and JPL. Holds BS, MS and Ph.D. degrees in electrical engineering, Rensselaer Polytechnic Institute.

*Jamshed Dubash, VP Business Development, CPG*

Seasoned business development professional and high technology entrepreneur and RFID expert. Successful track record of leading new ideas from concept to market and driving large multi-national projects. Held positions at Gillette (Proctor & Gamble) and Intel. Holds BSEE in Microelectronic Engineering, Rochester Institute of Technology, and MBA in High Technology, Northeastern University

*Dr. Christopher Jones, VP Advanced Technology*

Wireless industry veteran, visiting staff scientist at the Jet Propulsion Laboratory, and expert in channel code design for deep space and direct broadcast satellite communications. Among the earliest employees of Broadcom. Authored more than 50 publications and holds multiple US patents. Holds BS, MS and Ph.D. degrees, UCLA.

*Linda Prosser, VP Corporate Marketing*

Technology industry marketing executive with extensive experience in crafting and implementing programs to drive market development, awareness and brand position for market leading companies. Held positions with Alien Technology, Exar, VLSI and Adobe Systems. Holds BA Journalism degree from the University of Missouri.

*Damon Bramble, Senior Director, Customer Support and Service*

RFID implementation expert. Vast experience executing strategic rollouts with Fortune 50 companies. Held positions with Alien Technology, RFID Solutions Center, Dayton, RF Code and PinPoint Technology. Holds BS in mechanical engineering, Massachusetts Institute of Technology.

**Board of Directors**

*Rick Gold* – Chairman

InnoCal Venture Capital

*Peter Dumanian* – General Partner, Red Rock Ventures

*Tom Huseby* – Managing Director, Seapoint Ventures

*Ramin Sadr* – CEO, Mojix

**Investors**

Oak Venture Investment Partners

Red Rock Ventures

InnoCal Venture Capital

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