



End-to-End Traceability in Aerospace and Defense for Deltek Costpoint Users

Using Mobile Data
Collection and Barcoding
to Ensure Compliance
With Government
Contracts

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EXECUTIVE SUMMARY

A fighter jet suffers a critical system failure during flight. A guidance system in a defense battery fails to intercept incoming missiles. A naval ship at sea loses navigation abilities. These nightmarish scenarios usually are the result of faulty components, counterfeit parts, and materials of substandard quality. To prevent such scenarios, all parts and materials along aerospace and defense supply chains must be fully traceable with stringent quality control processes. Being able to fully trace parts and components, including serialized and lot-controlled items, through the supply chain and into a mission-critical military asset is vital for both security and compliance. Deltek Costpoint, used by many aerospace and defense contractors, enables them to trace parts and components from their origin. However, keeping track of parts throughout their production lifecycle remains a challenge.

Defense and aerospace contractors who manufacture and service government assets, store inventory in warehouses and conduct MRO for trucks, vehicles and aircraft, tend to use ERP systems for contracts with government agencies. Most commonly, they use the Deltek Costpoint ERP system to track inventory containing Accountable Personal Property (APP) and Government Furnished Property (GFP), while ensuring no counterfeit parts or faulty components infiltrate their supply chains. RFgen's Mobile Foundations software for Deltek Costpoint helps increase end-to-end supply chain traceability throughout the entire production process, starting with raw materials delivered to warehouses and ending with finished materials upon final delivery. Not only does this ensure compliance with government contracts, but also provides transparency in the event of a recall or an audit.



THE PROBLEM: VALIDATING PARTS AND MATERIALS TO ENSURE COMPLIANCE WITH GOVERNMENT CONTRACTS

Government contractors in the aerospace, aviation, and defense industries must be able to track and trace all parts and materials to their original manufacturers in order to comply with government regulations, including the Defense Federal Acquisition Regulation Supplement (DFARS), National Defense Authorization Act (NDAA) and International Traffic in Arms Regulations (ITAR).^{1,2,3} Otherwise, they risk getting their contracts cancelled or removed from consideration for renewal. In the worst case, contractors could suffer penalties for the most egregious or negligent violations. Plus, 89% of managers in the manufacturing industry believe that investing in new technologies to enhance end-to-end traceability would achieve time savings and productivity.⁴

The materials that must be tracked as per government requirements include as-engineered, as-built and as-manufactured parts. Contractors must also trace serialized items, lot controlled items and expiry-date controlled items (e.g. epoxy, composites, etc.). Generally, these parts and materials fall within the following two categories:

1. Government Furnished Property

There are two types of Government Furnished Property (GFP)⁵:

- ▷ Government Furnished Material (GFM)
- ▷ Government Furnished Equipment (GFE)

GFM includes government-owned property provided to contractors such as raw titanium for construction and consumable items. As per requirements set forth by the Federal Acquisition Regulations, contractors must establish and maintain records of GFM even after expended or consumed.

GFE includes special tooling, test equipment and other equipment provided to a contractor for use on a government contract.

2. Accountable Personal Property

Accountable Personal Property (APP)⁵ includes equipment or administrative property that meets at least one of the following accountability thresholds set by the Department of Defense (DoD):

- ▷ Exceeds the original acquisition threshold of \$5,000 or greater
- ▷ Is classified or sensitive
- ▷ Is furnished to a contractor

CHALLENGES FACED BY DOD CONTRACTORS USING DELTEK COSTPOINT

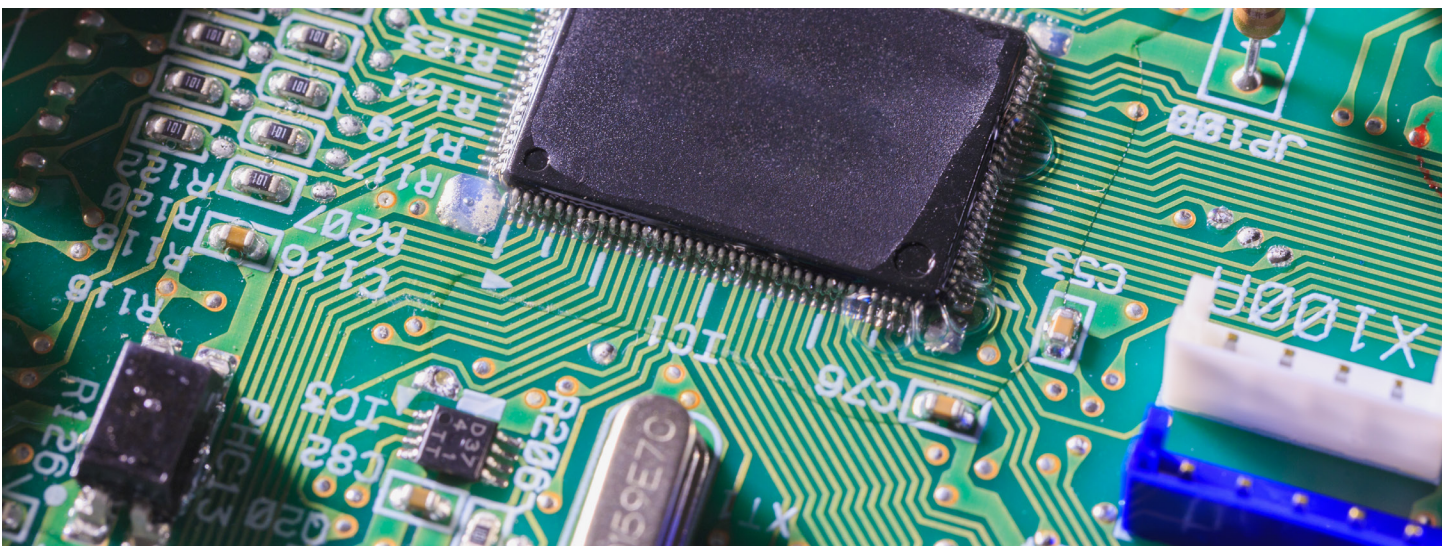
One of the toughest challenges DoD contractors often face is handling large volumes of data that must be recorded in their Enterprise Resource Planning (ERP) system. Many contractors do not have the adequate resources to handle such volumes, not only to maintain accurate and compliant record-keeping, but also to operate at scale, which may be a prerequisite to winning larger contracts.

Another challenge is low visibility into their inventories due to the use of manual and paper-based processes, making it difficult to maintain an accurate inventory of raw materials, components, government-furnished parts and equipment. Nearly 3,000-hours per year are lost at distribution centers due to such inefficient processes.⁴

When contractors fail to maintain an accurate inventory of such materials and equipment, they risk falling out of compliance with government

regulations. Deltek Costpoint has powerful traceability capabilities that enable users to trace parts and materials back to their origin. Costpoint comes with three levels of increasingly powerful traceability capabilities: Manufacturing, Advanced Manufacturing and Manufacturing Execution System (MES).⁴ To ensure full end-to-end traceability, Advanced Manufacturing or MES would be more suitable for tracking inventory by lot and serial numbers, making it possible to locate defects in manufacturing-on-demand (MoD) processes. These lot and serial numbers can then be traced back to their purchase orders and original vendors. This is prohibitively difficult to do using only manual paper-based processes.

Aerospace and defense contractors especially need full transparency in end-to-end inventory tracking to bring accuracy to near 100%, prevent counterfeit parts from entering their supply chains, and maintain compliance with DFARS and NDAA. Counterfeit parts, or even materials of sub-standard quality, can arise from the use of electronic waste⁶ or from intellectual property theft⁷, both of which are pervasive problems on the global scale.



FAULTY OR COUNTERFEIT PARTS INFILTRATING THE SUPPLY CHAIN

The number of counterfeit parts in supply chains has been increasing at an alarming rate in the last 10 years.⁸ Debbie White, the former senior director of product management for Deltek, an ERP software vendor designed for project-based businesses including government contractors, has long warned contractors about not allowing counterfeit parts to infiltrate their supply chains. White is now an owner and partner of Kinetek Consulting, which partners with Deltek and IBM. “You really have to validate your supply chain upfront,” she said. “A lot of these counterfeit electronics have leaked into the supply chain and

people didn't know about it. The problem is even your suppliers and distributors could be carrying counterfeit parts.”⁹

A 2010 report by the Bureau of Industry and Security (BIS) noted that, although unauthorized distributors were seen as riskier, the industry has generally regarded authorized distributors as safe. They assumed the parts they acquire directly from them are legitimate and do not require testing. However, when they procure parts outside of their OCM agreements, the picture gets murkier. “This practice, combined with buying back excess inventory from customers, has introduced counterfeits into the inventories of authorized distributors.”¹⁰



8 QUALITY CONTROL FACTORS CONTRACTORS SHOULD CONSIDER

As described in the previous section, defense and aerospace contractors have a particularly difficult situation with counterfeit parts, faulty components, and materials of substandard quality. It often takes a long time to procure specialized parts for these types of projects. For these reasons, contractors urgently need a thorough and systematic process for researching new suppliers and an airtight procurement system. “If I order a part that has six months lead-time and receive a counterfeit part, I’ve got a huge wait time before I can finish manufacturing my item,” said Debbie White of Kinetek Consulting.⁷

To help contractors strengthen their supply chain management systems and procurement processes that prevent faulty or counterfeit parts from infiltrating their inventory, the following questions need to be considered:

1. Does your supplier have proper procedures in place to prevent faulty components, counterfeit parts, materials of substandard quality from getting into the supply chain?
2. How confident are you that your distributors follow the proper procedures in acquiring the parts they deliver to you?
3. Is your internal quality control team trained to spot faulty, substandard, or counterfeit parts before they enter your inventory?
4. Does your inventory management system have the capability to “quarantine” or isolate suspected counterfeit parts, faulty components, or materials that do not meet quality standards as expected by the government?
5. Does your procurement system allow you to place vendors on hold while you investigate suspected counterfeit or faulty parts? Can it apply sanctions to vendors who have supplied these parts or components?
6. When you’re validating or approving a new vendor, what do you expect that vendor to produce for you (certifications, documentation, etc.) to ensure the vendor would not supply you with substandard or counterfeit parts?
7. Does your inventory management system include the ability to fully track and trace all parts back to the original purchase, supplier, and manufacturer?
8. If your processes do identify faulty components or counterfeit parts, what steps are taken to immediately remove these from your inventory? In the long term, how will you keep these parts out of your supply chain?



5 STRATEGIES TO MITIGATE RISK OF NON-COMPLIANCE

Defense and aerospace contractors need to improve processes to trace faulty, defective or substandard components traversing through their supply chains, and remove them in order to maintain compliance with government contracts as per DFARS and NDAA regulations. In addition to improving traceability processes, contractors may need to strengthen aspects of their purchasing, inventory control and other IT systems. The following strategies help ensure maximum traceability and regulatory compliance, particularly in the event of an audit or recall.

1. Order only from original manufacturers or authorized partners whenever possible.

The DoD recommends purchasing parts, materials and components from original manufacturers, authorized aftermarket manufacturers or suppliers that obtain parts exclusively from one or more of these aforementioned sources. Although purchasing directly from the original manufacturer is the safest way to avoid counterfeits or parts of substandard quality, there are many instances when contractors cannot source parts in this manner.

Most military aircraft have a service lifetime of more than 40 years, during which the hardware used to support the aircraft will change at least nine times.¹² The Aerospace Industry

Association (AIA) acknowledges that, in some cases, the necessary parts may no longer be available from the original manufacturers, authorized aftermarket manufacturers or authorized distributors. In fact, OEM supply chains are under constant pressure with order backlogs, high demand and quality assurance requirements.¹³

Richard Meene, director of the PwC Advisory Forensic Services, pointed out that OEM parts usually come with a premium price tag, and that as platforms mature, original manufacturers often stop producing the needed parts. Contractors must then rely on aftermarket parts or surplus original parts sold in the riskier gray market. Therefore, maintaining an adequate supply of the necessary inventory becomes critically important.¹⁴

2. Carefully research new suppliers according to business risk.

Contractors are advised to research new vendors based on the business risk that may be incurred. For example, buying a small quantity of parts for non-critical systems from a new supplier may only require simple research to determine that the supplier is a legitimate company with proper licensing and a physical location.

However, when the stakes are higher, due diligence should align with perceived business

risk. For mission-critical projects, research might include site visits to look for any sign of counterfeiting, plus thorough reviews of the supplier's purchasing, counterfeit detection and quality control systems. Deeper background checks on the officers and owners may also be necessary.¹⁵

3. Make purchasing terms and conditions more stringent.

Contractors need a fully transparent and compliant purchasing system because the Defense Contract Management Agency (DCMA) routinely conducts Contract Purchasing System Review audits. With counterfeit detection and avoidance regulations, contractors must employ tougher and more explicit terms in their purchase orders to suppliers. For example, contractors can specify they'll only accept certain brands of parts obtained from original manufacturers.⁷

Contractors should also require suppliers to maintain their own "acceptable counterfeit electronic part detection and avoidance systems" in compliance with the latest regulations.

4. Tighten quality control, testing, and counterfeit reporting procedures for incoming inventory.

Contractors also need more robust quality control procedures for incoming parts to detect and prevent counterfeits. It may be necessary to put incoming parts 'on hold' until they can pass quality checks, so that untested parts cannot be

used in production. Parts should also be visually inspected for obvious signs of counterfeiting, including sanding marks, polymer fillers, bent leads, and markings that don't match the manufacturer's product sheet.⁴

Any suspected counterfeits in the inventory system must be reported immediately, and the parts themselves must be quarantined until their replacements arrive.⁷ Contractors need an internal process for reporting suspected counterfeits or faulty components to the contracting officer and the Government-Industry Data Exchange Program (GIDEP), as required by DFARS. Personnel should also be trained on proper reporting methods pursuing remedies with the parts supplier.

Like new supplier research, inventory testing should be based on the level of perceived business risk. When a contractor receives parts directly from an OEM, limited testing may suffice. On the other hand, riskier situations may require more intensive testing such as performance testing, x-ray examination against specifications or even destructive testing.¹²

5. Trust, but verify—audit your suppliers over time.

Sometimes a contractor needs to use a supplier other than the original manufacturer or an authorized distributor. After the necessary due diligence and once a business relationship has been established, contractors need a system to monitor performance and make certain the supplier does not switch to less reliable parts after initial deliveries of legitimate parts.⁴

MOBILE DATA COLLECTION AND BARCODING CREATES FORWARD-TO-BACKWARD TRACEABILITY

Improving traceability is a problem that can be solved by modern supply chain processes and technologies. As a best practice, aerospace and defense contractors, manufacturers and Deltek Costpoint users should track all parts, materials and components traversing through their supply chains back to the original manufacturer, whether they are as-engineered, as-manufactured or as-built. The reason is, according to Debbie White, if counterfeit parts get into a finished product, contractors may risk losing their contract and subsequently go out of business.

The DoD, however, leaves contractors with the flexibility to decide which system to use for traceability as long as their processes include certification and traceability documentation. According to Crowell & Moring LLP¹⁶, a law firm specializing in litigation and regulatory matters, contractors must maintain clear identification of the name and location of supply chain intermediaries from the manufacturer to the direct source of the product for the seller, and—where available—the manufacturer's batch identification for the

electronic parts, such as date codes, lot codes or serial numbers.⁴

Covington & Burling LLP further cautioned that “although there is no mandated traceability technology, the preamble to the final rule notes that with respect to mission-critical electronic parts that could impact human safety, the DoD has a zero-tolerance policy.”¹⁷

To enhance supply chain traceability on GFP and APP, contractors need to implement mobile barcoding to automate data collection, digitize inventory processes and integrate with their Deltek Costpoint ERP system to create end-to-end traceability.

RFgen's Mobile Foundations solution helps aerospace and defense contractors—as well as other manufacturers and distributors—automate their data collection using mobile devices, barcoding and inventory control software. This results in near 100% inventory data accuracy along with other side benefits of going paperless, increasing worker productivity and boosting connectivity for remote and offline operations.¹⁸



THE BENEFITS OF AUTOMATING TRACEABILITY

At many companies, traceability is a manual and paper-based process. If a defective component or counterfeit part gets discovered in receiving, a contractor needs to respond quickly—isolating that part itself as well as the lot containing that part. They may even need to isolate several adjacent lots around the lot containing the faulty part. However, tracking defective parts by paper is usually a slow and tedious process.

A mobile barcoding solution drastically reduces manual errors, boosts accuracy up to 100% and helps achieve full traceability that meets regulatory compliance requirements. Maintaining compliance with regulations protects contracts from cancellation, non-renewal, or worse, non-compliance penalties. To fully automate the traceability process, however, it is important to select a mobile data collection solution with an approved integration to existing ERP, inventory control and purchasing systems.

BENEFITS OF AUTOMATED DATA COLLECTION

- ▷ Full Supply Chain Traceability
- ▷ Full Regulatory Compliance
- ▷ Full Protection from Penalties or Contract Cancellation

Using mobile barcoding technology with handheld scanners, employees can quickly transact against Costpoint to create multiple paths of traceability with inventory lot and serial number details. As such, the information contained in Costpoint can be updated with built-in data validations in real time during receiving, testing, internal transfers, manufacturing and order fulfillment.

If a contractor needs to respond to an audit, ADC using RFgen Mobile Foundations can help the contractor trace items in minutes that might otherwise take hours or days to track down using paper-based invoices and purchase orders.



For example, as parts and components are received from a supplier, barcode scanners can instantly capture up-to-date information including lot and serial numbers before passing these materials onward for identification, verification and testing. Applying quality control on receipts is an intensive data-entry process when using Costpoint only. Using RFgen along with Costpoint speeds up the QC process by up to 75%. Therefore, if a part is suspected to be counterfeit or defective, employees can quickly isolate that inventory with another scan to capture additional data for verification. When

each part is added into inventory, its corresponding traceability information will follow that part through each stage of production, even as it gets integrated into part assemblies, larger components and finished products that get delivered to customers.

As a result, mobile barcoding brings about an approximate 25% increase in efficiency as well as greater visibility into warehouses, storage rooms, shop floors, plants, shipyards and remote areas in the field. Mobile barcoding increases accuracy dramatically over a manual paper-based process, boosting productivity by at least 30%.^{4,16}



DELTEK COSTPOINT: ENSURING BILLING ACCURACY AND TRACKING GOVERNMENT-OWNED PARTS

Aerospace and defense contractors need to manage huge amounts of inventory and supply chain data, leading to challenges with record-keeping, traceability, supply chain visibility and compliance with government contracts. Many of these contractors turn to Deltek Costpoint for project-based accounting, because it helps them improve tracking across multiple projects, since they are contractually required to account for all assets, parts, components and even consumable materials in order to receive payments for them.

RFgen's Mobile Foundations for Deltek Costpoint is the industry's best enterprise mobility solution for Deltek Costpoint, addressing the aforementioned challenges with supply chain traceability and compliance.¹⁹ As an aerospace or defense contractor, your system may need RFgen Mobile Foundations for Deltek Costpoint if:

- ▷ End-to-end traceability and counterfeit detection are not fully in compliance
- ▷ Paper-based or spreadsheet-based processes are still contributing to errors and inaccuracies
- ▷ There are difficulties with keeping track of raw materials and electrical components
- ▷ Some inventory is stored in remote locations with poor data connectivity

- ▷ Your GFE/GFM reports take longer than three hours to compile
- ▷ The contracts you are bidding on require significant traceability requirements
- ▷ Asset management and MRO processes need to be further optimized
- ▷ Warehouse inefficiencies hamper worker productivity
- ▷ Providing proof of asset inspection is difficult
- ▷ Providing proof of delivery to the end customer

RFgen Mobile Foundations for Deltek Costpoint includes tailor-made transactions, mobile barcoding and pre-built mobile apps spanning Purchase Order, Manufacturing and Inventory Management Suites. RFgen Mobile Foundations can either be run on-premise or as a SaaS, is also configured to work specifically with Deltek Costpoint so that all manufacturing processes can communicate with the ERP system in real time. As a result of mobile barcoding, bringing inventory data accuracy to near 100% and other process optimizations, inventory management workflows can be better streamlined with improved visibility into the supply chain from manufacturers to customers in the DoD or aerospace industry.

SUCCESS STORIES WITH INCREASED TRACEABILITY IN DEFENSE AND AEROSPACE

RFGEN MOBILE FOUNDATIONS FOR DELTEK COSTPOINT

RFgen Mobile Foundations for Deltek Costpoint is the best Deltek-validated mobile solution in the defense and aerospace industries that provides real-time and two-way communication between Deltek Costpoint and barcode scanners, handheld devices, and any technology that collects and communicates data including RFID, IoT, IIoT and physical automation devices. Both VSE Corporation and Insitu used Mobile Foundations for Costpoint to increase inventory data accuracy and ensure that all supply chain items are traceable in real time.

VSE CORPORATION

In one case, a strategic partner to the DoD had been using manual paper-based processes to track their inventory. Employees at VSE Corporation were managing MRO using Excel spreadsheets, which would later be re-keyed into their Deltek Costpoint ERP system. They needed to eliminate these tedious and error-prone processes to boost traceability and to comply fully with contracts with the DoD. VSE used RFgen's Mobile Foundations to seamlessly integrate automatic data collection using mobile devices to their Costpoint system. "RFgen really blew our socks off. You could scan something and data would appear in Costpoint

live—in real-time," said Cathy Henry, Director of IT Operations at VSE Corporation.²⁰

INSITU

In another case, a manufacturer of unmanned aircraft systems (UAS), used RFgen Mobile Foundations to improve warehouse efficiency and inventory accuracy.²¹ Insitu needed a new mobile data collection solution because their existing barcoding software was unreliable, difficult to use and lacked the necessary integration with Deltek Costpoint. With RFgen Mobile Foundations for Deltek Costpoint, the UAS manufacturer was able to automate mobile data collection, optimize inventory processes, streamline manufacturing workflows, and obtain full visibility into all parts, materials and components.

LESSONS LEARNED

As defense and aerospace contractors make decisions about the type of traceability system to use, they may need to examine the practices of another industry with a direct impact on human safety—the food and beverage industry. Just as food containing harmful ingredients or tainted by certain bacteria can cause illness or death for consumers, failed microchip could have harmful or even fatal consequences in a safety-critical defense system.

CONCLUSION

When human lives and national security are at stake, there is no place for counterfeit parts, defective components, or any materials of substandard quality. The government mandates that both contractors and subcontractors must establish a fully compliant traceability system to track all government-owned parts as well as all components and raw materials supplied to the government. Defense and aerospace contractors are required to eradicate counterfeit parts and faulty components from their supply chains.

This paper has outlined strategies for minimizing supply chain risks, including supplier due diligence, automatic mobile data collection, increasing inventory data accuracy and ensuring that all materials are fully traceable, whether they are as-built, as-manufactured or as-engineered. Due to new regulations passed in recent years, aerospace and defense contractors need to establish an

airtight system—with strong data security—for ensuring end-to-end traceability.

As with other highly regulated industries that impact human safety, aerospace and defense contractors can benefit from a viable mobile solution to track and trace all parts in their supply chains. A mobile barcoding solution enhances internal inventory processes to help create end-to-end traceability throughout the supply chain, rapidly identifies defective components, reports suspected counterfeit parts and complies with traceability audits. For contractors using Deltek Costpoint, RFgen Mobile Foundations is the best solution that seamlessly integrates with Costpoint out of the box, helping to reduce staff training by up to 80%, boost worker productivity by 30%, driving efficiency increases of up to 25% throughout the supply chain, thereby increasing revenues and profitability as a result.



RFGEN SOFTWARE

THE MOBILE DATA COLLECTION EXPERTS

*Reduce supply chain implementation costs with
RFgen Mobile Foundations software—*
**one of the industry's most reliable and flexible mobile and wireless
automated data collection solutions on the market today.**

RFgen is a market leader in barcoding software solutions for mobile data collection, warehouse automation and inventory management, providing the industry's most reliable and flexible platform since 1983. We provide an end-to-end guided experience with a knowledgeable team of experts to help you establish a self-sustaining digital ecosystem that ensures long-term viability.

As your trusted advisor in this process, we are fully invested in your success and to position your organization for growth through transparency, visibility and mobility enablement of your inventory and fixed assets. After implementation, RFgen consultants will continue to provide support by empowering your team through training and education to maximize your investment and assure future self-sufficiency.

RFgen isn't just a solution to your business challenge. Our brand promise is to equip each of our customers to meet the competitive challenges of the 21st century. By introducing key technology solutions that extend existing software platforms and infrastructure, we help customers unlock hidden efficiencies to achieve significant gains in daily operations with downstream benefits to your enterprise, supply chain and business partners.

Whether you are looking for solutions to automate your warehouse and better manage your inventory, comply with government regulations, ensure 24/7 warehouse operations, track and trace your products, voice-enable your warehouse, or manage your remote inventory, RFgen is the smart choice.

To learn more, please call us at 888-426-2286, or
[click here to Request a Software Demo](#)

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