Supply Chain Solution Guide

IT-approved Identification Solutions for Global Operations

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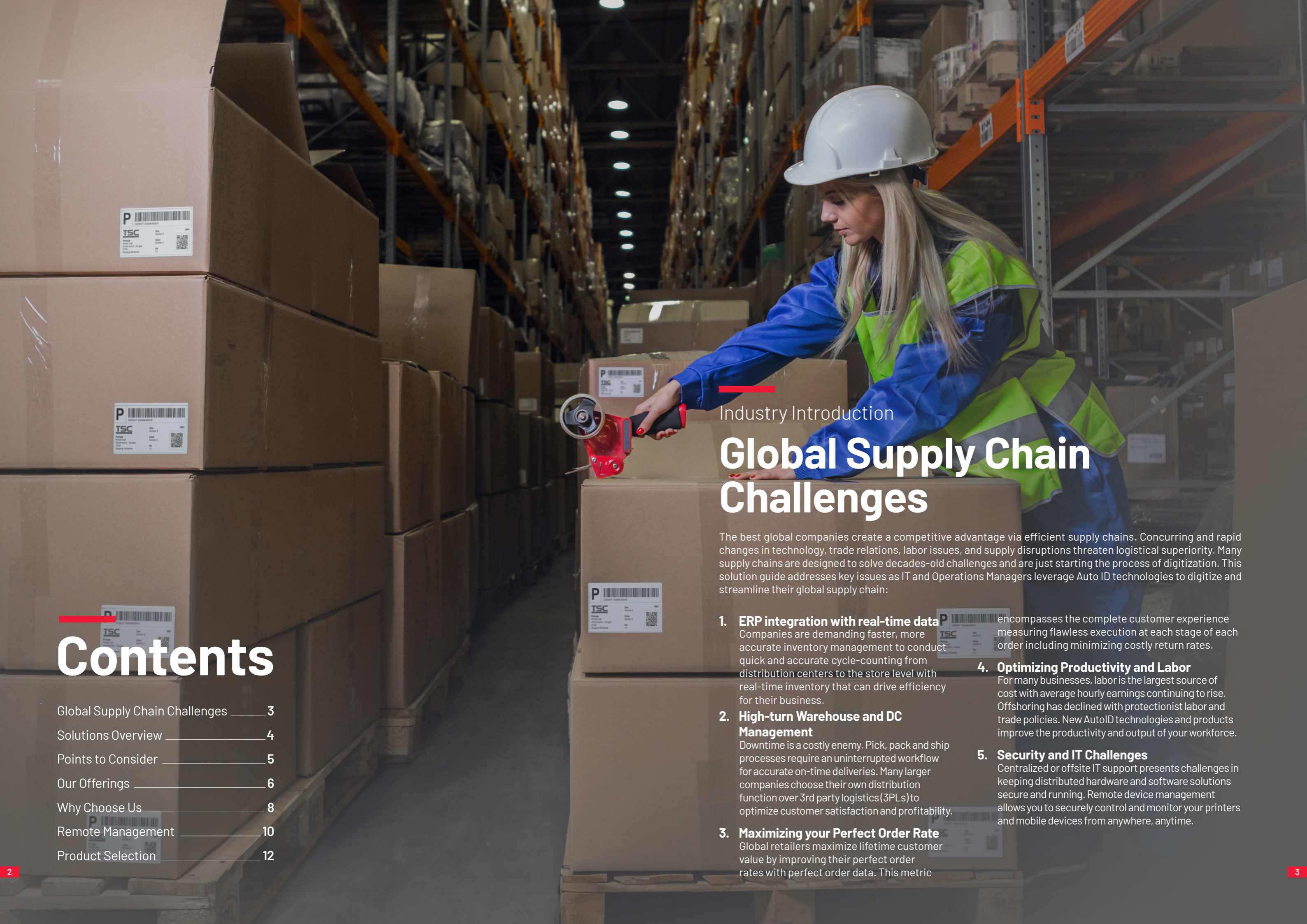
Industry Introduction

Global Supply Chain Challenges

The best global companies create a competitive advantage via efficient supply chains. Concurring and rapid changes in technology, trade relations, labor issues, and supply disruptions threaten logistical superiority. Many supply chains are designed to solve decades-old challenges and are just starting the process of digitization. This solution guide addresses key issues as IT and Operations Managers leverage Auto ID technologies to digitize and streamline their global supply chain:

1. **ERP integration with real-time data**
   Companies are demanding faster, more accurate inventory management to conduct quick and accurate cycle-counting from distribution centers to the store level with real-time inventory that can drive efficiency for their business.

2. **High-turn Warehouse and DC Management**
   Downtime is a costly enemy. Pick, pack and ship processes require an uninterrupted workflow for accurate on-time deliveries. Many larger companies choose their own distribution function over 3rd party logistics (3PLs) to optimize customer satisfaction and profitability.

3. **Maximizing your Perfect Order Rate**
   Global retailers maximize lifetime customer value by improving their perfect order rates with perfect order data. This metric encompasses the complete customer experience measuring flawless execution at each stage of each order including minimizing costly return rates.

4. **Optimizing Productivity and Labor**
   For many businesses, labor is the largest source of cost with average hourly earnings continuing to rise. Offshoring has declined with protectionist labor and trade policies. New AutoID technologies and products improve the productivity and output of your workforce.

5. **Security and IT Challenges**
   Centralized or offsite IT support presents challenges in keeping distributed hardware and software solutions secure and running. Remote device management allows you to securely control and monitor your printers and mobile devices from anywhere, anytime.

Solution Overview

Optimizing your Supply Chain with Auto ID Solutions

In response to these challenges, TSC has heavily invested in IT and Operations-centric solutions using reliable, efficient and secure AutoID technologies. Traditional and 2D barcodes along with RFID have become an invaluable tool for digitizing your supply chain from the automatic generation of work orders to inventory management and product traceability. A higher perfect order rate is now within your control. Key benefits discussed in this guide include:

- Optimized receiving and shipping processes using scannable barcode labels to ensure accurate cross-docking, proof of delivery, and error-free fulfillment.
- Real-time inventory visibility with RFID technology to maintain optimal inventory levels, increase warehouse turnover rates, optimize pricing, and prevent stockouts.
- Cost-effective and easy to manage mobility solutions to collect, analyze, and view critical business data anywhere in value chain.
- Warehouse management solutions that integrate with existing equipment and workflows to optimize receiving and pick and pack processes.

- Device management from anywhere to monitor device health, ensure security, troubleshoot configurations and settings, and maintain the highest asset uptimes.
- Reduced label, ribbon and liner waste for shipping labels, supporting your sustainability and cost-savings goals.

Points to Consider

Key Considerations when Building your AIDC System

When designing, upgrading, and deploying your AIDC equipment, like barcode and RFID label printers and mobile computers, look to maximize your return on investment (ROI), scale your solution and future-proof your processes by considering these key factors:

Verify Barcode Quality
Managing raw materials coming in from suppliers and then goods out to your customers relies on readable barcodes. Guarantee success, reduce rework and boost perfect order rate by automatically inspecting barcode quality.

Request RFID Encoding and Scanning Assessment
Request an automation assessment and learn the financial merits of an RFID solution to improve cycle count accuracy, lower unproductive labor spend and increase supply chain visibility.

Rugged Mobile Printing and Scanning
Minimize downtime. Generate and scan codes anytime, anywhere with durable and reliable mobility solutions, that include battery management for harsh environments.

Labeling Automation Boosts ROI
Automating your labeling operation is a high ROI project. Labeling can be repetitive, ergonomically challenging, and may not increase the value of your product, making automation using print and apply systems a smart target. Also consider semi-automated solutions.

Linerless Printing
Go eco-friendly and eliminate liner waste from your operation with linerless label printing. Sustainability projects like this have benefits beyond ES&G and can eliminate steps during production and shipping.

Remote Device Management and Connectivity
Securely manage devices from anywhere with solutions that connect with your business systems to sustain, manage, and control your assets for maximum return on investment and minimum headaches.
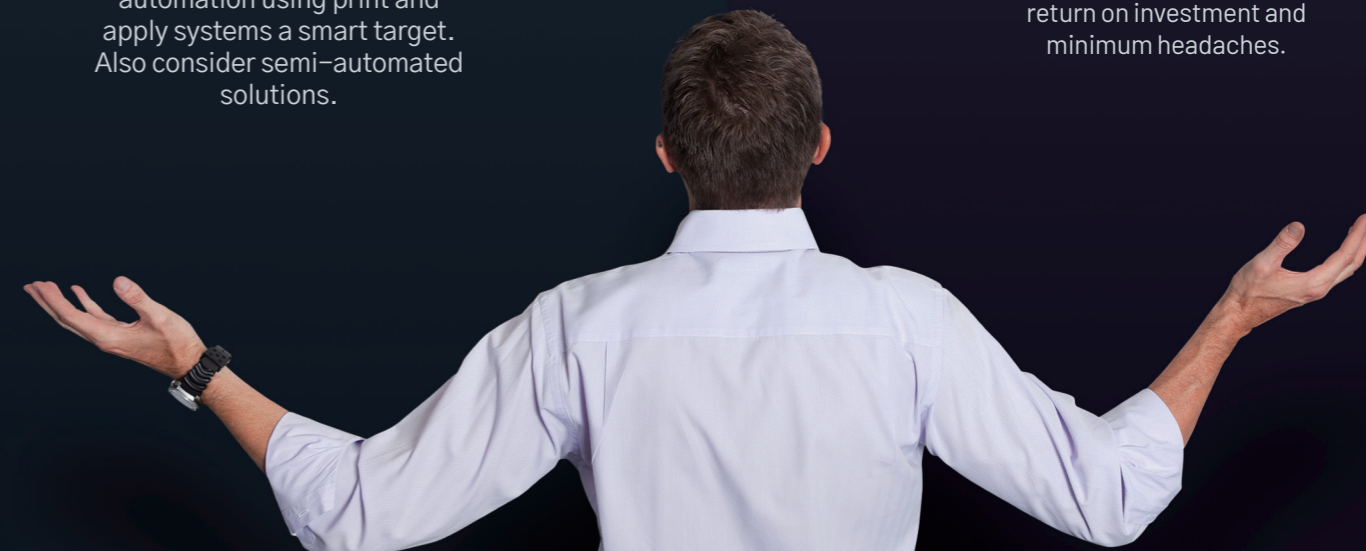
Comprehensive Enterprise Auto ID Solutions

TSC Auto ID offers a wide range of solutions tailored to your global supply chain, addressing key challenges like inventory management, traceability, and production efficiency. Our solutions include:

Barcode Quality

Barcode printing and scanning has reduced errors related to data entry from 1 out of 300 to 1 out of 3×10^{10}, but the consequences for barcode failures in the global supply chain can be devastating including carrier loss, chargebacks, automation errors, and product rework. The good news is that most of these concerns can be mitigated by employing a barcode inspection system using 100% verification. Our exclusive ODV-2D barcode inspection technology easily validates and verifies barcode labels. Based on the robust T8000 and T6000e printer platforms, ODV-2D grades barcodes to ISO standards and stores a detailed report of each transaction. Our exclusive technology reads each barcode, overstrikes the entire label of a rejected barcode, and reprints a new label automatically. You can also use the high-accuracy, high resolution scanners embedded in our S50 rugged mobile computers to ensure your goods come and go on schedule.

Mobility Devices

The use of handheld devices is vital for everyday business needs, requiring fast performance with persistent connectivity, advanced data capture, lightweight ergonomics, as well as simplified and secure authentication. Our Bluebird mobile devices fulfill critical business missions with numerous key features such as multi-OS support, true mobility and industry-leading battery life. Plus, ergonomic and rugged designs with network connectivity that is globally certified. The product lineup includes rugged handheld computers like the S20, S50, and S70, which are built for durability and equipped with the newest technology and support for the stable Android 13 OS and up to Android 17. We also provide ultra-rugged, high-performance models such as the EK430 and EF551, which are optimized for physical keyboard operations and demanding environments, respectively.

Barcode Inspection
T8000 ODV / Bluebird S50

RFID Experts
T6000e / Bluebird S50 with RFR901

Mobile Printing & Scanning
Alpha-40L / Bluebird S70

Automation PEX
PEX 2000 Print Engine / Bluebird T30

RFID Experts

RFID has become a trusted industrial standard in the global supply chain owing to improvements in tagging costs, standards in encoding and formatting, and improvements in read range performance for demanding applications. Beyond becoming the best practice for managing reusable shipping assets (RSA), RFID workflows are eliminating time and labor associated with inventory management and asset locating. We are enabling these applications both with our award-winning RFID print-and-encode platform based on the T6000e series and with the Bluebird RFID RFR901 scanners offering the fastest scan rates (over 1300/sec) and longest read ranges (over 10 m). We offer hard-to-find solutions for large labels, on-metal tags, lightweight grips, long-lasting battery life, scan-and-encode interoperability, and the most accurate calibration in the industry.

Sustainable Labeling

Sustainability is critical to reduce the environmental impact from complex and global supply chains. Besides that, measures to reduce material usage also result in cost savings that drive additional profitability. We offer solutions that cut waste and enhance efficiency. Our linerless printing technology eliminates backing liners, reducing waste as well as improving safety by preventing slips. Our print engines with ribbon saver technology minimize ribbon waste, especially for pre-print labels with serial numbers. Adopting these solutions helps manufacturers meet environmental goals, reduce consumable costs, and create a greener, safer work environment.

Automation PEX

Automation continues to drive cost and quality improvements in supply chain operations with recent investments in automated storage and retrieval systems, sortation systems and voice picking. These systems rely on accurate AIDC barcodes and RFID labels to function. You can also drive significant ROI by automating your labeling workflows. The PEX Series print engines produce barcode labels at fast print speeds, allowing for labeling in record time. The mechanism is designed to fit easily in any print-and-apply system thanks to its fully compatible structure and GPIO interface. We work with dozens of ISVs and integrators, allowing us to boast the most print language compatibility of any manufacturer. PEX print engines are ideal for warehousing and logistics applications where high-speed and high-demand label printing is required to keep up with production, order fulfillment and industry regulations. They are also configurable for automated RFID applications. Our T30 series tablets and kiosk systems ensure the right information is at the right time and place during automated workflows.

Benefits of TSC and Bluebird Award-winning Systems

Even small supply disruptions can cost your business approximately $50,000 per minute of downtime and even more when factoring in lifetime customer value. We are proud to be recognized by our clients for our product quality, reliability, and user-friendly printer designs, which minimize downtime and streamline operations. Explore the range of goals and initiatives we can support with these benefits:

Maximize Productivity

We coined the metric mean-time-between-failures (MTBF). With MTBFs measured in years, our mission is to maximize asset up-time and your productivity. Our industrial printers, built with advanced engineering, all-metal construction, high-capacity ribbons, and intelligence, are designed to perform 24/7 to keep pace with your operations. Our mobile devices, readers and printers feature IP-rated, drop-resistant durability, long battery life, fast-charging, and a full range of accessories, ensuring reliable performance in harsh environments.

Interoperability that Scales

TSC enterprise-grade industrial printers offer seamless ERP integration with a comprehensive emulation library, supporting various printer languages (Postscript, PDF, IPDS) and data streams. We handle diverse label and ribbon combinations, accommodating the broadest specifications for label dimensions, label accuracy, thickness and materials. New TSC mobile devices run on Android and Linux, are upgradeable, and compatible with the most common business applications.

Convenient Remote Printer Management

Our BOS Nest, PrintNet Enterprise (PNE) and TSC Console Web remote device management tools allow IT teams to securely configure, update, and troubleshoot your deployed devices easily. We also incorporate a wide array of system integrators and 3rd party management solutions like SOTI Connect.

Lowest Cost of Ownership

TSC's ODV-2D systems for thermal printers automates label inspection and barcode verification, correcting errors without operator intervention. Plus, we control-chart printer performance, prompting maintenance to boost productivity and cut costs. Our BOS care platform streamlines device fleet management and optimizes deployment with built-in efficiency tools.

Shortest Deployment & Down Times

We offer a variety of tools and solutions to support fast device deployment including the TSC Rapid Deployment USB device clone feature, the Printronix Quick-Change Memory Cartridges (QCMC) to support rapid enterprise-grade industrial printer deployment and Bluebird BOS Nest Rapid Deployment functions for mobile devices. These solutions make cloning, provisioning, and deploying IT-approved devices fast and reliable returning your supply chain to full operation and slashing deployment and upgrade times in your facilities.

Most Advanced RFID Encoding

TSC devices help you eliminate tag clutter and pollution with the most advanced native character to bit conversions and the most accurate encodings you need to control the sequence of elements from your most significant to least significant bits. Check out our latest firmware releases allowing you to verify tag encoding as you go available in certain TSC printers.

World-class Training and Support

We have dedicated resources to engineer, coordinate, and deliver for our global customers. Our experienced field engineers are ready to support and solve the most challenging AutoID applications, and our highly trained technicians are ready to help answer all of your mobile device, label, and label printing questions.

Remote Management, Deployment and IT Solutions

BOS, TSC Console and Console Web

TSC Console and TSC Console Web

TSC Console Web is a web-based version of TSC Console—a printer management tool offering remote configuration, quick implementation, troubleshooting, and preventive maintenance. Now you can achieve centralized monitoring, cross-device management, intuitive data visualization, and enhanced team collaboration in a single device management tool. TSC Console offers your business solutions to:

- Centrally manage both TSC Auto ID and Printronix Auto ID printers
- Log device records and apply rules-based proactive alerts for preventative maintenance
- Manage and monitor your printers remotely across all your devices
- Enhance troubleshooting efficiency, reduce downtime, and lower maintenance costs
- Gain insights for your print assets with intuitive dashboards and visualizations
- Securely control authority levels to access, change and manage configurations

Bluebird BOS™

The Bluebird Business Optimizing Solutions (BOS™) are professional and comprehensive IT and mobility tools that scale. Developed over 20 years, this platform was developed specifically for IT Managers, Field Operators, Business Owners and Developers to maximize the ROI of mobile computing and distributed devices in your environment. The BOS suite of mobile device tools includes tools geared to:

- New Business Solution Development with BOS SDK
- Fast and Easy Device Deployments with BOS Provisioning
- Enhanced device security, location, and access control
- Communicate and Collaborate Securely with BOS VoIP
- Manage Assets with BOS NEST (Mobile Devices) and BOS TMS (Terminals)
- Process innovation and workflow automation

Select the Right Solutions for Your Applications

Mobile

2"	3"	3"	3"	4"
Alpha-2R	RE310*	Alpha-30R	Alpha-30L	Alpha-40L

Desktop

2"	2"	2"	4"	4"
TTP-225 Series	DH220 Series	TH220 Series	DH240 Series	TH240 Series
4"	4"	4"	4"	4"
TX210* Series	DL240* Series	TL240 Series	DA210/DA220 Series	TE200 Series

Industrial

4"	4"	4"	4"	6"	6"
ML241P Series*	MB241 Series	MH241 Series	T6000e	T6000e	MH261 Series
4"	6"	8"			
T8000	T8000	T8000			

*Limited availability in the US and Canada, please contact your local sales representative.

Select the Right Solutions for Your Applications

Linerless

3"	3"	4"	4"
Alpha-30R	Alpha-30L	Alpha-40L	MB Series
2"	4"	4"	
DH220 Series	DA220 Series	DH240 Series	

Barcode Inspection

4"	4"	6"
T6000e ODV-2D	T8000 ODV-2D	T8000 ODV-2D

Print Engine & Modules

4"	6"
PEX-2000 Series	PEX-2000 Series

RFID Printers

4"	4"	4"	4"	4"
Alpha-40L RFID	T800	T4000	T6000e	PEX-2000 Series
6"	6"			
T6000e	PEX-2000 Series			

Mobile Computers & Enterprise Tablets

Handheld Computers

Handheld mobile computer with high-performance for enterprise

| S10 | S20 | S50 | S70 | S70 Explosion Protection | EF551 | EF550/EF550R |

Managed Computers

The sleek and bezel-less design of a consumer smartphone with enhanced durability and enterprise functionality

| SF650 | HF550X | HF550X RFID |

Keypad Computers

The ultimate touch mobile computer with keypad

Interactive Tablets

The right customer service solution for your business

Mobile Computers & Enterprise Tablets

Handheld RFID Readers

| RFR901 for S50 | RFR901 for SA | RFR901 for U mount | RFR900 for SA | RFR900 for S50 | RFR900 for S70 |

Short Range RFID

HF550X RFID

Fixed RFID Reader

FR900

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