



How to Boost Productivity with Industry 4.0

Discover the Potential of Weighing

Don't wait for Industry 4.0 to happen. You can already today drive your production processes to become more automated and connected. We explain why you should speed up and integrate manual processes into your existing systems, make use of weighing data for process optimization and enable remote monitoring.

Recent developments surrounding Industry 4.0 and the Internet of Things are facilitating a major paradigm shift in manufacturing. Traditional production hierarchy, with centralized control, is shifting toward a decentralized self-organization, in which the product independently communicates with the production devices and actively intervenes in the production process.

Digitalization of weighing equipment

As measuring technologies evolve, digitization has become a core element of innovation. As a result, an intelligent measuring device or sensor provides more than just accurate measuring values. In addition they can provide qualified real-time

status information about the manufacturing process, collect measuring results and steer production equipment. Measuring devices, such as weigh modules, platforms and terminals, can be built into highly modular assembly lines and conveyor belts. There they can be either automated or operated manually. Despite increasing automation, manual work will not disappear in modern factories. Assembly, quality checks and material handling is still done by operators on manual workplaces. Manufacturers are now looking for equipment that allows them to integrate these workstations into their systems. On the operational side, innovative interfaces, user guidance and intuitive handling features can enable productivity potential in factories today.

Industry 4.0 and manual workplaces

Not only automated production lines benefit from Industry 4.0; manual workplaces also can increase productivity when they can overcome the challenges of the novel interaction between people, machines and data. Workers have to manage faster processes, a higher degree of digitalization and a greater variety of applications. In addition, they have to deliver continually high quality while product customization increases. That is why it is important to bring together efficiency, ergonomics and data integration.

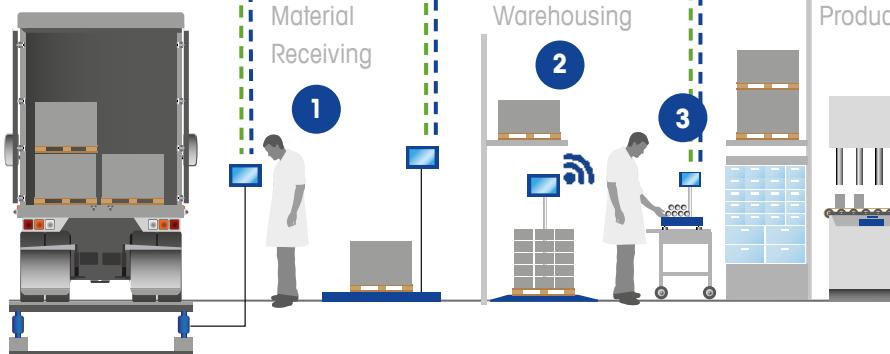
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Supplier



1 Intelligent Logistics

Start production supervision at your factory gates. Review the deliveries from your suppliers with measuring equipment such as floor and bench scales. Floor scales can count bulk shipments of parts and components whilst compact scales apply when receiving small or valuable material. Weighing devices feed weighing results to your network and prevent over- or out-of-stock situations.



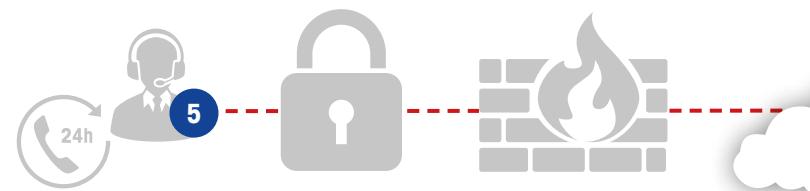
2 Use warehouse entry to gather data

Use bench scales in warehousing to perform picking tasks, cycle counts and prepare exact deliveries for intra logistics. Get orders from your ERP systems and send back the results of your operation. Weighing terminals feature advanced human-interface functions, such as user prompting, for error-free handling and speedy processing.

Publisher/Production

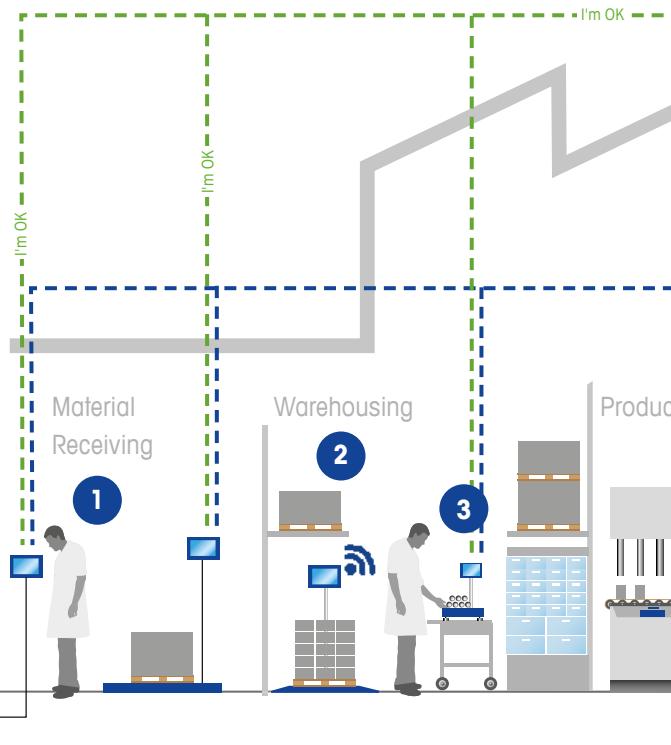
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5 Preventative maintenance with Remote Equipment monitoring

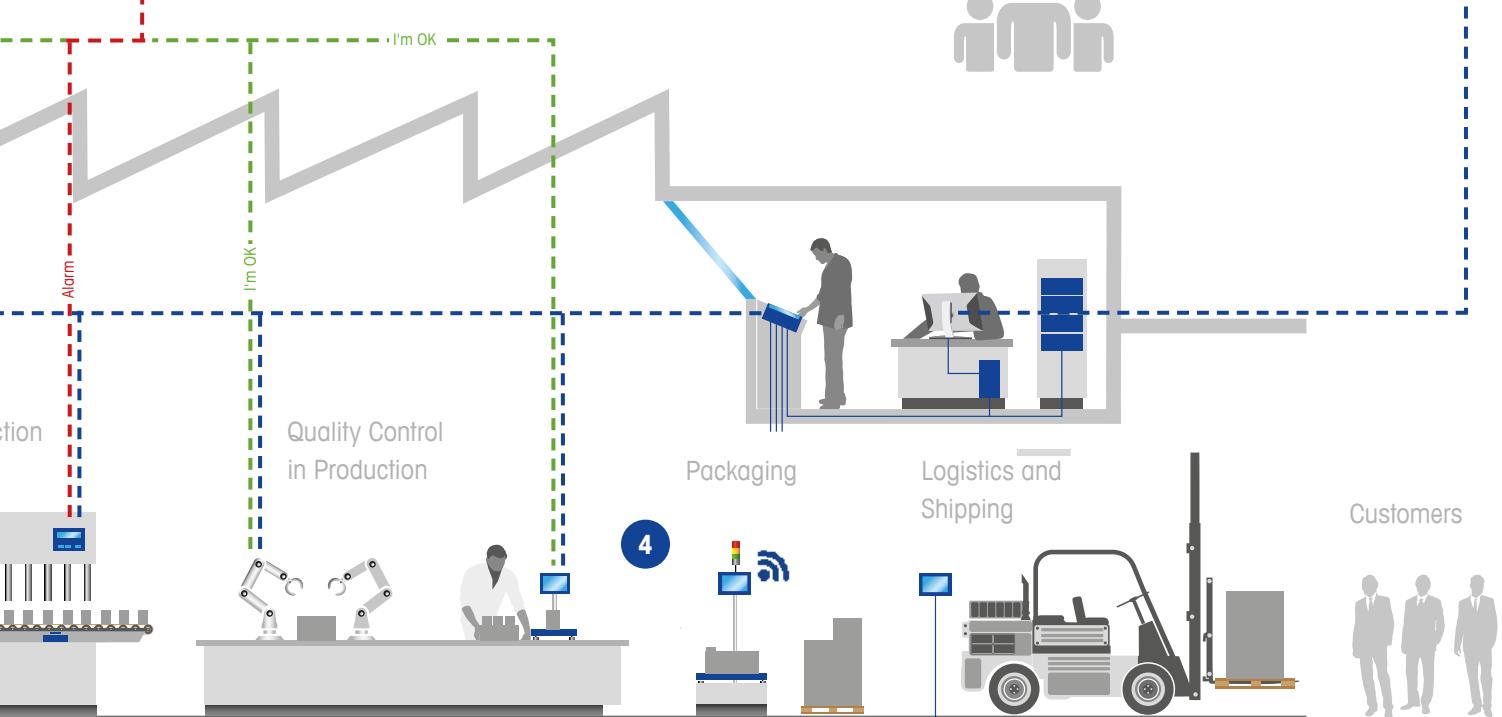
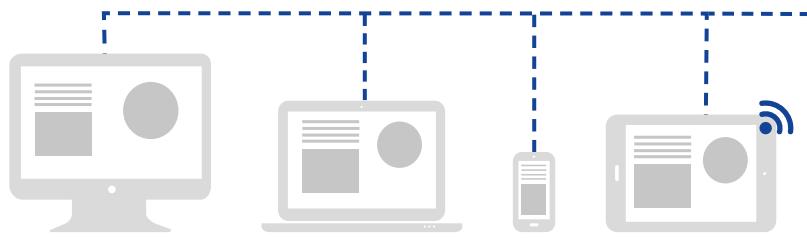
Cloud-based remote monitoring of weigh modules, load cells and scales prevents downtime. Remote support facilitates fast repairs and reduces the need for on-site interventions. All data transfer is protected with third-party accredited security measures.





Collect+™

Data Collection Software



3 Innovative HMI's increase handling speed by 30%

Reduce waste and quality cases with innovative piece-counting and quality check solutions. Scale management software saves all article records and makes recalling article data error-free and fast. Together with the colorWeight® result indication this speed-up quality checks even if the product variety increases significantly.

4 Monitor production flow and worker efficiency in real time

Collect+™ software captures production-weight and process data from every scale on your shop floor and visualizes it in an easy to understand dashboard. Use data for audits, quality initiatives and process optimization.

Keep Production Running

Effortless Remote Monitoring

When an incident makes a weighing device fail or deliver undetected false measurements, the consequences to quality and productivity can be critical. Cloud-based remote equipment monitoring identifies potential issues before they influence product quality and uptime.

What if you could prevent unwanted downtime in critical production processes? Intelligent measuring devices make it possible by initiating preventative maintenance actions before problems occur. METTLER TOLEDO weighing

terminals with embedded InTouchSM Remote Services connectivity can send alerts to remote service technicians or internal personnel. Performance issues are immediate addressed, which means more uptime and fewer unforeseen expenses. Pro-

tected by proven IT security measures, InTouch securely improves your performance and uptime by keeping production running, avoiding unplanned downtime and planning repair at the right time for your business.



Efficient Equipment Management

- Real-time equipment status information
- Fact-based timing of preventative maintenance activities
- Abnormal condition change triggers email alarm notification



Improved Performance Control

- Ongoing monitoring of measuring performance
- Avoid overnight downtime surprises
- Expiration of calibration is monitored to ensure compliance
- Periodic asset status reports to optimize processes



Security without Compromise

- ISO27001-2013 certification
- User authentication and access control
- No changes to existing IT or security infrastructure



Remote Services for Weighing Equipment

Examples of events monitored to ensure the health of your weighing assets include:

- RAM battery critically low
- Calibration expiration/test dates
- Control limit failures/capacity issues
- I/O communication errors
- Low-level load-cell excitation
- Zero captured during calibration



Terminals with remote service capabilities

METTLER TOLEDO weighing terminals, including the IND570 and IND780 with InTouchSM Remote Services, are ideally suited for applications that require little downtime. Alerts and events will no longer go unnoticed. When a problem is detected, you are automatically informed. Depending on the services you choose, either you can take the required action or our service center technicians may resolve the issue remotely or dispatch a field technician.

► www.mt.com/ind-intouch-remote-ma

Innovative Operator Guidance

Article Visualization for Correct Counting

The medical technology sector has strict requirements for product and process transparency. To keep pace with production, a counting solution with a custom touchscreen supplies the right amount of parts at the right time with correct labeling.

WEIDMANN PLASTICS TECHNOLOGY AG develops and produces high-quality injection molded plastic components for leading brands in the medical sector. The production of these small and very small parts takes place under cleanroom conditions. Continuous automated production yields thousands of highly standardized plastic components each day. The final products are assembled in the factory at several manufacturing stations.

Smooth production logistics

For internal logistics to keep pace with assembly, precise delivery to different production stations in the factory is required. Therefore, it's necessary to accurately supply batches of thousands of plastic parts, weighing only a few grams each, and to deploy them for further processing at the right time. Additionally, the medical technology sector is particular regarding the data provision and the label printing to guarantee traceability along the complete supply chain of sensitive products.

Custom solution

We developed PC terminals to meet the requirements of their customized piece-counting system. We also created a software solution based on the IND890. The software was designed for the specific needs of the company and adapted to the existing production system. Four counting workstations consisting of an IND890 terminal, barcode scanner, attached printer and a KA32s weighing platform are distributed throughout the plant. The weighing platform has a capacity of 3 kilograms, and thanks to the force-compensation load cell, a readability of

0.1 gram. That high accuracy is a major advantage for accurately counting large boxes of lightweight parts.

Innovative touchscreen

The IND890 terminal stores all products that are to be counted, including the most important data of each item, such as the average piece weight, target quantity, counting tolerances, packaging and corresponding image. The product master data can be easily altered and managed using a PC application. The weighing terminals provide the product pictures on the home screen.



The counting bar graph on the terminal indicates the fill level.



Select a product via the touchscreen and tap to begin the counting operation. Product visualization in combination with the IND890's touchscreen simplifies handling with intuitive navigation. The desired target capacity or package fill level is clearly visible via the colorWeight® display. The entire weighing process takes only a few seconds.

Label creation and SAP input

At the end of the counting process, a label with the item or batch numbers, the number of parts and the associated barcode is printed. The employee attaches the label to the container and the production data is collected via barcode scanner and sent to SAP. Production logistics staff have an ongoing accurate inventory count and the ability to easily plan for future needs.

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Create labels instantly for perfect traceability.

IND890: Programmable Terminal for Custom Solutions



IND890 program can be customized for applications ranging from workflows to data integration with enterprise-level software. It features:

- Human-machine interface and application customization
- Microsoft .NET language support
- Display capabilities up to 19" color TFT
- SQL database

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Don't Risk Component Malfunction

A Drop of Lubricant Matters

Weighing instruments quickly and precisely control the amount of lubricant applied to parts or components. Flexible configurations provide end-of-line or in-process checks that keep the production line moving.

In combustion engines, pumps and turbine parts, the amount of oil applied can be critical. Too little creates unnecessary wear, while too much oil is a waste and impedes performance. When trying to measure and apply lubricant on the assembly conveyor itself, speed is also an important factor. To protect profit margins, the lubricant must be applied

quickly and accurately. Weighing instruments offer a simple, fast and secure way of checking for the correct application of lubricant.

Check lubricant of parts and components

In a heavy-duty engine part, such as a piston, too little or too much lubricant can

result in failure or destruction of the part during operation. In ball bearings and motor parts production, weighing equipment can check the quantity of applied lubricant during or after the application process. Weighing equipment can either steer the filling process or check the amount applied after the operation. In either case, weigh the product against a



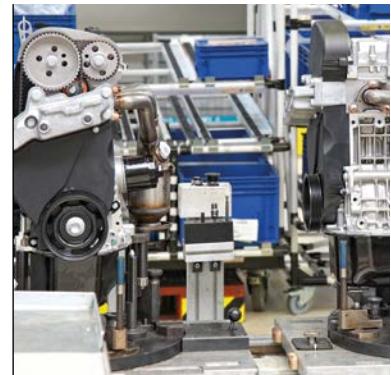
Check More than Samples with Bench Scales

When checking parts and components for correct application, you can either use a bench scale for manual control or an end-of-line checkweigher. The quality is checked after the application.



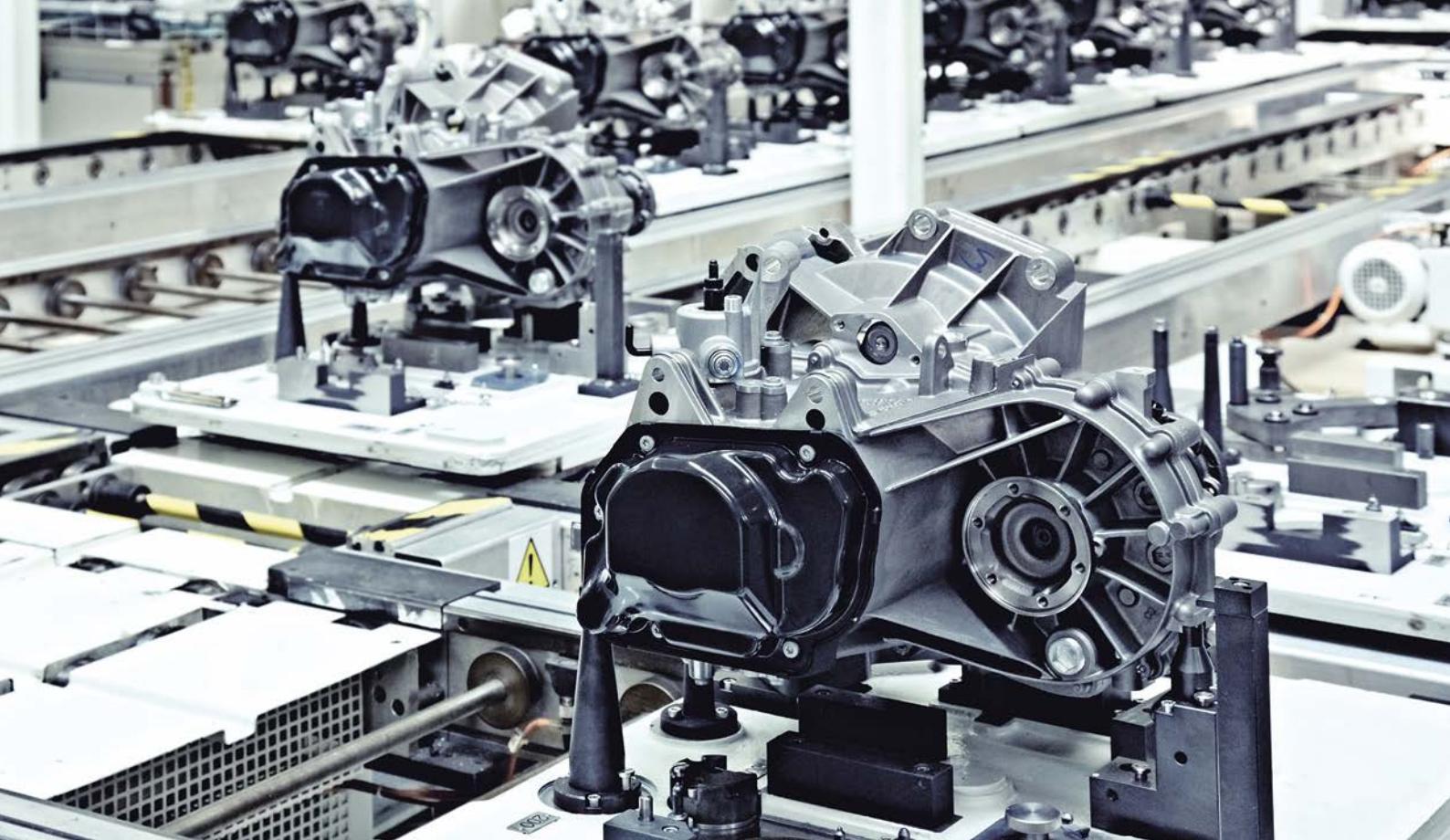
Control Heavy Parts with Weighing Platforms

For components or heavy metal and automotive equipment, a weighing platform built into conveyor belts allows accurate application without holding up the manufacturing process. The weighing equipment controls the application process.



Use Weigh Modules for High-Speed Applications

Check the application of lubricants or coatings with built-in weigh modules. Unrivaled speed and accuracy make it a fast and reliable quality checkpoint. The weigh modules either check for completeness after the application or steer the filling process.



preset target weight to check if the lubricant was applied within tolerances.

Set-ups for end-of-line control

Depending on your throughput and production processes, use a high-resolution compact scale like the ICS685 (for small batches) or an end-of-line checkweigher (for larger batches and/or high-throughput operations). The equipment can find even the smallest deviations at an incredible speed. That is achieved through smart-display function for manual operation and high throughput of checkweighers. It enables you to get 100% control, so you can keep delivering high-quality products to customers.

Application control in-line

For heavy parts, such motor or turbine components, weighing platforms and weigh modules are used in the lubrication application and are directly checked

on the conveyor belt. That saves time and costs while increasing speed. For complex and expensive assemblies, it's too late if a product is out of tolerance at the end of line or when it reaches customers. To guarantee accurate application, the weigh module or weighing platform is connected to a PLC built into the conveyor belt. The motor moves onto the high-precision weighing platform, and a scale terminal, such as the IND570, checks if the lubricant is applied within tolerance.

That rapid operation has a substantial effect on product quality. Due to the flexibility of METTLER TOLEDO equipment, it's possible to have different motors or components on a single assembly line, with the installation of situation-specific configurations within individual filling parameters.

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Tips & Tricks: How to set up Quality Check Solutions



Learn about weigh modules for fast in-line checkweighing.

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Check out PBK/PFK 9 high-precision weighing platforms with a readability from 0.001 gram and a capacity to 3 000 kilograms.

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Download Whitepaper about Quality Control:

► www.mt.com/ics5-quality-ma

Error-Free Packaging

Lightweight Bulk Goods

Stop giving away money due to incorrect filling of packages and transport boxes. Use your optimization potential and fulfill your customers' orders exactly. With the ICS4 and ICS6 scales, you can avoid over- and under-filling when shipping lightweight small parts.

Think of the price of raw material for metal and high-tech plastics. It could be that you are giving away profit due to inaccurate deliveries. When you manufacture and ship thousands of small parts, accurate packaging offers big cost savings. Due to the low price and weight of individual units, managers often don't realize that there is huge optimization potential in filling and packaging their deliveries. Just ask yourself: Do you always send more pieces than ordered – just to make sure you are not under-sup-

plying? When you manufacture a fixed amount on a contract basis every extra piece means less profit for a company.

Correct customers inventories

It is not only you that is giving away money when overfilling your packages. To supply customers with low warehouse capacity just-in-time, you need to package the exact number ordered. Otherwise the company's warehouse management system will indicate inaccuracies in stock. That causes extra effort for customers and

leads to complaints. By using the ICS4 or ICS6 scales, you can optimize packaging. Achieve fewer errors, build batches easily and ensure high throughput.

Error-free, secure counting

With a scale, you simply need to define the average weight of the piece to be shipped and start filling your box or package until the preset target number is reached. The scale automatically counts the number of pieces boxed and the colorWeight® backlight display indicates if the target pack-



Package with colorWeight – fast, exact and easy to use.



Optimal counting station – platform, terminal, scanner and printer.



Scales attached to printers supply labels instantly for speedy processes and traceability.



age weight is reached. You can fill thousands of small parts accurately, quickly and error-free.

Instant label-printing for traceability

Make bulk goods traceable. Use scales to count exactly and ship your packages with the right labels. With scales, you can use predefined printing templates or customize your own in different formats,

such as labels, strips, forms, pictures and barcodes. Different formats can be defined, including article numbers, date and time or customer logo. A variety of standard printers and third-party printers can be used.

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colorWeight®



Tips & Tricks: How to Create a Perfect Counting Workplace



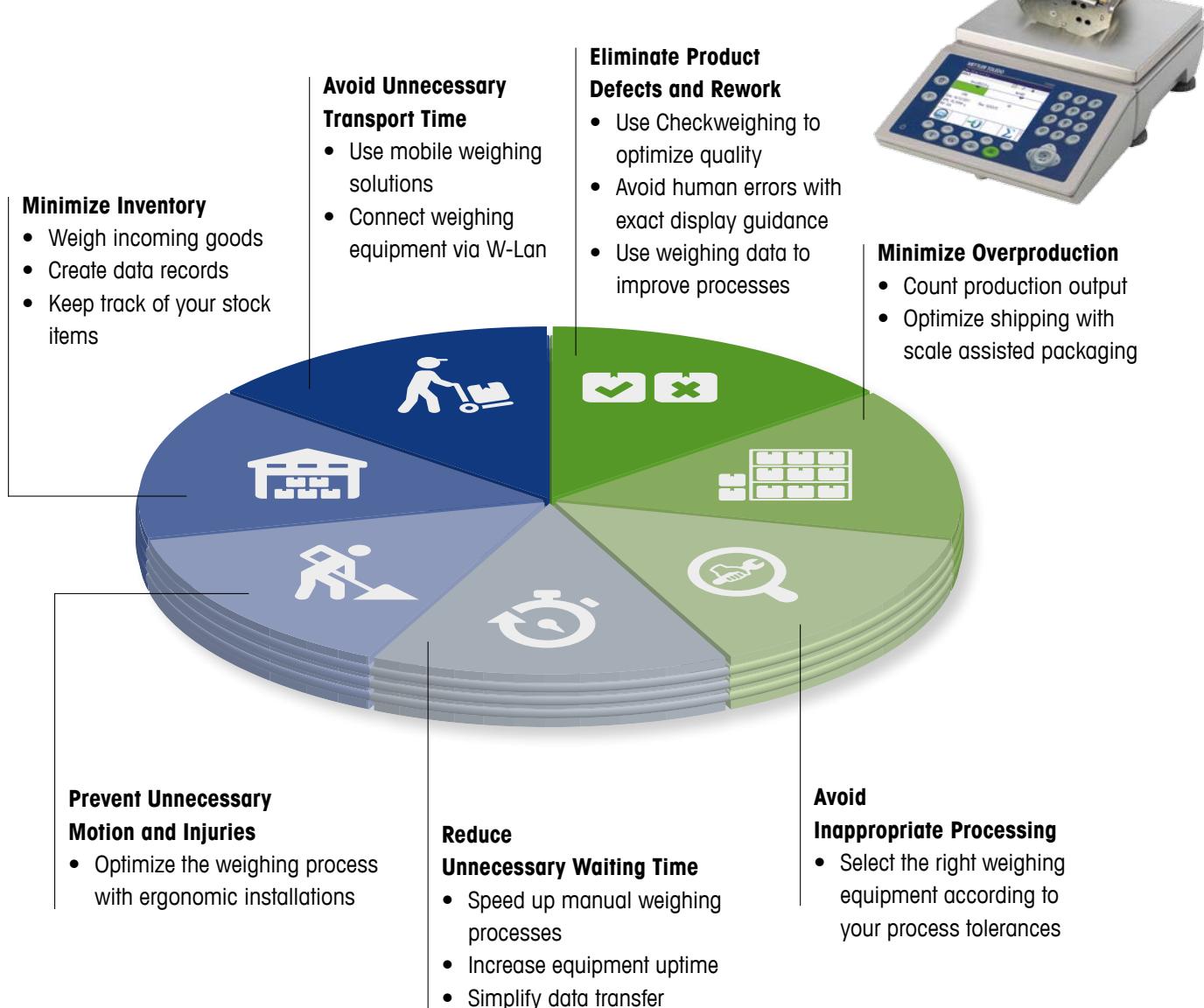
Attach scanners to read order bar-codes, add printers for instant label creation and facilitate automatic data transfer into your production system.

Download Application Note:

► www.mt.com/ind-perfect-piece-counting-ma

Eliminate Your 7 Wastes of Lean

Improve your Parts Production with Weighing



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