WEBER

EDUCATIONAL EBOOK

ROI Calculator for Complex Screwdriving

ACCESS ONLINE CALCULATOR

WEBER USA is launching its ROI calculator to help manufacturing facilities determine the return on investment when switching their manual screwdriving processes to automated solutions. The calculator covers everything from operator costs, maintenance and downtimes, screwdriving applications challenges, and mean-time-between-failure rates.

Not only does the WEBER ROI calculator do all that, but it also helps you track uptime for each piece of equipment. This eBook takes you through how to use the calculator and covers each essential component to consider when looking at ROI and Overall Equipment Effectiveness (OEE).

Use the calculator to assess your ROI when upgrading your existing manual, semi-automated or fully automated screwdriving equipment to a WEBER automated screwdriving system. A WEBER automated solution gives you a clear indication of your OEE and how you can save time and money, increase throughput, and develop higher-quality products.

FACTORS TO CONSIDER WHEN EVALUATING ROI FOR A SCREWDRIVING APPLICATION

When evaluating the ROI on automated screwdriving operations versus human operators, consider the costs of human versus robotic workforces and the availability of operators.

With factors such as The Great Resignation, just getting people to work at a more structured job is tough right now. Also, manual operations include training – and the risks of the employee leaving to go work for a competitor.

Will your human operator show up today? Maybe. You can have an inexperienced person fill in that just reduces output and possibly affects quality? Maybe. Your automated screwdriving system will always show up.

Yet, there are still factors to consider with an automated solution (like downtime). Let's cover each factor as you input the values of human operators versus automated solutions.

Operator Costs

To enter the cost of human operators, collect as much information as possible regarding the costs associated with human labor versus automated systems. The costs of human labor include:

- Wages (including wage inflation)
- Other non-wage benefits
- Payroll taxes
- Worker's compensation insurance
- Safety equipment
- Training

Whenever you replace an operator with a piece of automated equipment, you do not have to worry about the many variable costs associated with salary, benefits packages, paid time off, sick leave, etc. Your automated screwdriving system doesn't come with these considerations – or expenses.

When using the calculator, you can easily input the data for the number of shifts, hours per shift, and the number of operators. The WEBER ROI calculator makes it as easy as entering a few basic values to learn the ROI of investing in a WEBER screwdriving solution.

Let's go over each area and break them down for you.

Basics:

This section includes all basic information about the maximum daily output per shift using the total shifts to cover, the number of hours working, and production speed.

- Shift
- Hours and minutes
- Production speed (screws per minute)
- Max Output

CURRENT ASSEMBLY PROCESS	
Max Daily Output	
Shifts	2
Hours p/ Shift	8
Daily Hours for Cell	16
Max Working Minutes Per Day	960
Production Speed (pieces/minute)	120
Maximum Daily Output (pieces)	**115,200**

NEW ASSEMBLY PROCESS	
Max Daily Output	
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Availability:

Once you have entered the basic information regarding the operations you are looking to automate, you can move on to availability. The human workforce is not as reliable as a WEBER system. They must take breaks. Also, they may not be able to come in for a shift or ask for time off to go on vacation.

Your automated solution will never require a break, time off, or be a no-show to work. You'll also want to consider the times when the automated equipment will not be in operation. Let's evaluate the human and automated components to input:

- Breaks and lunch
- Changeovers
- Cleaning time and maintenance
- Unplanned downtime
- Total time lost

Availability	
Break time/Lunch (minutes)	30
Changeover (minutes)	30
Cleaning/Organizing	60
Unplanned downtime	30
Total time lost per day (minutes)	300
Availability	**68.8%**

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Performance:

Automated screwdriving solutions improve the overall performance at your facility. With the WEBER ROI calculator, you can see how much. For example, if your maximum production speed is 120 units per hour, but your actual speed is 110 units per hour, your overall performance is just over 91%.

If your WEBER screwdriving equipment improves actual performance speed to 115 per hour, your facility's operating performance will increase to nearly 96%. Input your own operation's values to see how WEBER can improve your overall operating performance for:

- Ideal speed
- Actual speed

Performance	
Max Production Speed	120
Actual Production Speed	110
Performance	**91.7%**

Performance	
Max Production Speed	120
Actual Production Speed	115
Performance	**95.8%**

Quality:

Human errors create quality issues with your products. Reduce human error and flag and identify problems with product quality by automating screwdriving processes. Use the WEBER calculator to determine what your overall quality improvement can be when you factor the output of scrap versus good product for:

- Reject and scrap %
- Good product

Quality	
Reject/scrap	3.5%
Quality	**96.5%**
Overall Equipment Effectiveness (OEE)	**60.8%**
Actual Daily Output (pieces)	**70,059**
Widget value (piece)	$0.25
Daily Production	**$17,515**

Quality	
Reject/scrap	2.5%
Quality	**97.5%**
Overall Equipment Effectiveness (OEE)	**64.2%**
Actual Daily Output (pieces)	**74,003**
Widget value (piece)	$0.25
Daily Production	**$18,501**

If the technology you use creates too much scrap, this will also impact your bottom line. For example, if your operation includes a screwdriver with a standard clutch, you lose control over that device. WEBER offers a torque transducer you can program a better tightening strategy to reduce scrap.

ADDITIONAL BENEFITS OF A WEBER SCREWDRIVING SOLUTION

While this isn't something you can necessarily calculate, you should consider the additional benefits of an automated WEBER solution versus a human operator. The two most significant benefits besides the overall ROI include:

Flexibility

Other than understanding how system flexibility will increase output, there isn't a calculation to determine if the automated screwdriving solution you choose is more flexible than your current manual processes. However, WEBER systems enable variability in screw tightening limits, torque accuracy, data collection, and statistical process control.

WEBER also allows you to be flexible with your initial investment. Start small and scale as needed. When you hire a human workforce, the costs of onboarding and hiring a new operator are generally fixed and offer little to no flexibility.

Time Savings

Consider how much easier (and faster) it is to program an automated screwdriving system than it would be to train a human operator to perform the same function. While you have to train a person within the facility to maintain the automated system, that is less time-consuming than training someone on how to perform screwdriving tasks.

Automated processes are generally faster. They are also more accurate, meaning fewer scrap or rejected parts. You can save time within your operations when you increase throughput and do not have to run a production line longer than necessary to meet demands.

REASONS TO REPLACE YOUR EXISTING PROCESS WITH A WEBER SCREWDRIVING SOLUTION

Nothing leaves the WEBER facility until they have tested the screwdriving system and proven all equipment to be 100% reliable. If it fails one time, we start the validation process over. We do not ship anything out until it passes through our rigorous testing. With that data, use the ROI calculator to determine how that factors into your existing process.

If your current process only operates at 95%, the WEBER ROI calculator can tell you exactly what your cost of investment in a WEBER screwdriving system would be. For example, one WEBER customer explains why they made the switch to WEBER from the cheaper, manual screw guns they were using. Here is a recap:

The auto-feed screwdrivers they were using were unreliable and had a high frequency of downtime. The systems required maintenance one to two times per week for as long as half an hour, and specialized maintenance personnel were required to perform the routine maintenance.

Replacement parts often needed replacing and were quite costly (upwards of $525 each or more), caused high amounts of downtime plus required the monthly $25 for the custom screwdriver bits. Let's break down how they were able to assess their savings by switching to a WEBER system.

Annual Labor Savings

Estimated annual labor savings (.63 hours/week x 50 weeks) 31.5 Hours

Not only must you consider the time it takes for employees to finish maintenance tasks, but you must also factor in whether you have to pay someone with specialty skills to maintain your screwdriving process. In this client's situation, their previous systems required a Maintenance and Production team to maintain their equipment.

Annual Replacement Parts Savings

Estimated annual replacement parts savings ($525 x 6 per year + $25 x 12 per year) $3,450

Replacement parts cost and availability are significant concerns for any screwdriving operation. With recent supply chain disruptions due to global crises, you might not only find that parts are more costly but that they are on backorder due to a lack of supply.

WHY CHOOSE WEBER? USE THE ROI CALCULATOR TO FIND OUT!

At WEBER, we developed our ROI calculator to make it easier for you and your teams to justify the switch from your current manual operations to automated screwdriving solutions by WEBER. Whether you need to present your finding to a board of directors or facility stakeholders, the WEBER ROI calculator determines how much they can save in the costs of operation. Reduce the overhead of human operators, and the ROI calculator will tell you how much return you can expect on your automated screwdriving investment.

For more information about the WEBER ROI calculator and how to use it to determine the right automated screwdriving solution for your operation, reach out to WEBER today.

Example reviewed in the eBook

MANUFACTURING ROI ON COMPLEX MACHINE CELL AUTOMATION INVESTMENT

INVESTMENTS IN AUTOMATION PAY FOR THEMSELVES

**Inputs are in blue, calculated cells are black.*

CALCULATOR VARIABLE INPUTS

INVESTMENT IN AUTOMATION **$2,000,000**

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PROFITABILITY

Labor Costs	
All-In Hourly Machinist Cost	$35
# of Machinists Per Shift	2.0
All-In Annual Employee Cost: Technician	$60
# of Technicians Per Shift	1.0
Daily Labor Cost	**$2,080**
% of Revenue	*11.9%*
Widget Material Cost Per Piece	$0.11
Daily Widget Costs	**$7,986**
Daily Cell Contribution Margin	**$7,449**
Contribution Profit Margin	*42.5%*
Workdays per week	5
Annual Cell Revenue	**$4,553,835**
Annual Cell Contribution Margin	**$1,936,675**
# of Cells	5
Annual Cell Revenue	**$22,769,175**
Annual Cell Contribution Margin	**$9,683,375**
Profit Margin	*42.5%*

NEW ASSEMBLY PROCESS

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# of Machinists Per Shift	1.0
All-In Annual Employee Cost: Technician	$60
# of Technicians Per Shift	0.5
Daily Labor Cost	**$1,040**
% of Revenue	*5.6%*
Widget Material Cost Per Piece	$0.11
Daily Widget Costs	**$8,349**
Daily Cell Contribution Margin	**$9,112**
Contribution Profit Margin	*49.3%*
Workdays per week	5
Annual Cell Revenue	**$4,810,163**
Annual Cell Contribution Margin	**$2,369,023**
# of Cells	5
Annual Cell Revenue	**$24,050,813**
Annual Cell Contribution Margin	**$11,845,113**
Profit Margin	*49.3%*

RETURN ON INVESTMENT

OEE IMPROVEMENT	**3.4%**	
CONTRIBUTION MARGIN IMPROVEMENT	**6.7%**	**$2,161,738**
AUTOMATION RETURN ON INVESTMENT (Year 1)	**8.09%**	
AUTOMATION RETURN ON INVESTMENT (3 Years)	**224.26%**	

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