



INDUSTRY 4.0 WHITEPAPER

Step 3 | 10 Tips for MES Implementation

Preface

Manufacturing companies are exposed to fierce and unfair competition. Strategic measures must be taken continuously in order to ensure the company's long-term success and to keep the effect of negative factors as low as possible. A Manufacturing Execution System (MES) helps companies to position themselves in the production area in a future-oriented manner and is a recognized path to Industry 4.0. The focus of this whitepaper is on providing you with 10 tips for a successful MES implementation.

An MES is a comprehensive software solution for the production area. It supports all operational functions, e.g. machine scheduling and personnel availability planning, order control (registration/deregistration of orders), maintenance, recipe and document provision, acquisition and analysis of process and machine data, and much more. In addition, an MES builds a bridge between the corporate management level and production. It establishes the connection between the existing ERP/PPS application on the one hand and the machines and plants on the other, which enables a continuous, IT-supported flow of information and data throughout the entire company.

By recording machine and personnel times as well as visualizing downtimes and malfunctions in real time, an MES also provides comprehensive and precise data on all integrated production processes around the clock.

With this information, these processes can be precisely controlled, accurately analyzed, reasons for disruptions can be identified and eliminated more quickly, and production processes can be optimized. However, an MES includes further functions: Production planning, for example, creates the basis for cost-optimized production. With the module Traceability, the flow through the entire value chain of a product can be traced. Maintenance is also supported in day-to-day work, for example through maintenance suggestions and digital documentation. In addition, there are many other requirements that can be met by MES modules.

Conclusion: With a comprehensive MES solution, you can equip your production to be ready for Industry 4.0.



Dr. Karl-Heinz Gerdes, Founder of FASTEC GmbH



About the Author

Dr. Karl-Heinz Gerdes is the founder and former Managing Director of FASTEC GmbH and has been active in the field of computer-integrated production for over 30 years. During his studies he was already working on microprocessor-controlled automation solutions. The development of decentralized control and networking solutions for interlinked plants with master computers was ultimately the guiding principle for the founding of FASTEC GmbH. The MES solution FASTEC 4 PRO, which is distributed by FASTEC today, was developed on this basis and has become even more sophisticated due to the experience gained from many complex customer projects.

Think Big – Start Small

1. Start With Small Steps.

Since the introduction of an MES is a very comprehensive project, you will only be successful if – with the big picture in mind – you take one step at a time.

It makes the most sense to start where the greatest benefit can be achieved the fastest. Start your MES project on one machine first – preferably on a bottleneck – and discover hidden optimization potential. As soon as you have the first data from the system, you can start optimizing. Starting your MES project in small steps has many advantages. One of them is that the project you start will pay for itself in a very short time once you improve your production performance. After you have successfully completed this step and gained your first MES experience, the rollout to additional machines or lines can follow.

“From the experience of many projects, we can say that the fastest potential to be exploited is to increase the productivity of the machines. Our motto is: The most expensive first.

Unfortunately, many companies often have little idea of how (un)productive their machines really are.

We therefore advise you to start with Machine Data Acquisition and to use the OEE key figure for your improvement process. With the MES module Machine Data Acquisition (MDA), you also lay the foundation for the use of additional functions.”

Dr. Karl-Heinz Gerdes
Founder of FASTEC GmbH

MES entry-level solutions offer you the opportunity to test your MES potential at a low price without great effort. So-called productivity measuring devices are connected to a single machine without any software installation, which means that all required machine data (e.g. quantities, cycle times, scrap quantities and downtimes) can be recorded, evaluated and analyzed directly, automatically and in real time.

Together with the operator’s input, this gives you exact information about the effectiveness of a machine workstation in terms of performance, availability, quality level and OEE (Overall Equipment Effectiveness).



Communication Is Key: Put Your Cards on the Table



2. Get All Employees Involved.

For the project to be successful, it is important that all employees understand what MES is about and with which tasks each individual contributes to the success of the project. Experience shows us that this step in particular takes a lot of time. The introduction of production optimization software „along the way“ is rarely successful.

In our experience, those responsible for MES have to expect about two to four months of hard work until everyone involved pulls together. But even after that, the project is not over: Measures such as CIP (Continuous Improvement Process) need a driving force to ensure that efficiency is permanently increased and then remains at a high level.

These successes will help you to take the next step all the more confidently. Inform all parties involved early and extensively.

This helps you to achieve the necessary acceptance for the MES, which significantly contributes to meeting the project implementation schedules. As a rule, you can receive relevant information material from your MES provider in order to comprehensively inform all employees and departments involved about the advantages and benefits of an MES implementation and to dispel their reservations.

3. Work Hand In Hand With Your Works Council.

Inform the works council right from the start that an MES is to be introduced. In this way, the collection of personal data can be regulated right from the start and the concerns about the „transparent employee“ can be taken away. This is important not only because it is a project subject to codetermination, but also because it can have a decisive influence on the approval or rejection of an implementation.

Your works council can be an important help for you during the introduction, as it knows the fears and hardships of the employees (fear of surveillance, of change and job loss). Well integrated and trained by corresponding project and product knowledge, the works council can help to directly dispel the employees' concerns and convince them of the MES benefits for the company. By using productivity reserves, the efficiency in production is sustainably increased. This makes work easier for individuals and secures jobs in the long term.



Start With Holistic Considerations

4. Buy an MES and Not a Deceptive Package.

In the selection process, make sure that you choose a full-fledged and standardized MES (i.e. a product and not a specially programmed individual solution). Some systems offered as "MES" are pure MDA/PDA systems (MDA = Machine Data Acquisition, PDA = Production Data Acquisition). Although this makes it cheaper to get started, it can turn out to be a costly mistake in retrospect. Especially if you want to use additional MES modules later (e.g. Detailed Scheduling, Maintenance or Traceability) and then have to rely on a third-party solution. This can then only be implemented at high costs and with error-prone interfaces. A full-fledged MES should therefore have a modular structure and be able to cover the entire production process with its modules. In this way, you can avoid isolated solutions and expand your MES at any time and entirely according to your own requirements. In addition, you can be sure that your system works with a uniform, cross-module database, which guarantees stable and high-performance information processing in the future.

5. Where Is the Greatest Need for Action? Start Right There.

MES are mostly modular and you can choose from a modular system with modules such as Machine Data Acquisition (MDA), Production Data Acquisition (PDA), Maintenance, Detailed Scheduling, Traceability, etc. and assemble your MES according to your requirements. It is best to first start with the module that you absolutely need to create a database. In this way, the employees can slowly familiarize themselves with the functionality, get used to the new system and be convinced of the advantages. The integration of further modules is much smoother because the employees are already familiar with the system and know how to operate it.

6. Put Together an MES Project Team.

The MES introduction is a project in which complex human, technical and organizational requirements have to be taken into account. It is therefore important to put together a project team from different departments, to first make everyone understand the reasons for the MES introduction and then to jointly develop a requirements catalog for your MES provider.

Good Planning: Crucial For a Successful MES Rollout

7. Schedule Internal Resources Well in Advance.

The implementation of an MES requires some time and know-how, also from your colleagues. Therefore, it is very important to create a task plan and time schedule early on. Generally, the employees who have been assigned to the MES implementation also have to carry out their normal day-to-day business. Therefore, it is necessary to consider and plan in advance exactly who can take on which tasks and when, and how the employees can be optimally prepared for their tasks – be it through training or appropriate documentation.

In your planning, also take into account that unplanned events can occur both in day-to-day business and during MES implementation, which can lead to schedule delays. Consult your MES provider. The provider will provide you with documents that show you which internal resources are needed, when and for what. Usually, you can also have your MES provider provide the necessary training, such as MES administrator or MES key user, to build up the required know-how in your company.

8. Schedule External Resources Well in Advance.

When planning, keep in mind that you may also have to use external resources and that these must also be planned accordingly well in advance. When an interface to your ERP system or direct communication with the PLC of the plants is to take place, external specialists are often required to make adjustments. Please take this into account in your scheduling as well as in your cost calculation. Ask your MES provider whether they have the necessary know-how. If necessary, your provider has in-house PLC programmers or can provide you with information on the PLC coupling or a sample PLC module. This can be an important time and cost advantage during the MES implementation.

9. Include Time Buffers in Your Schedule.

Take advantage of the experience of your MES provider and plan time buffers for unexpected events. To avoid delays that negatively impact other deadlines and add unnecessary costs, plan enough reserves in your schedule for internal and external processes and resources.

Then you can be sure that the milestones defined in advance will be met on time, that internal and external resources will work together smoothly and that there will also be enough time to adequately respond to unforeseen problems during implementation. Your MES provider can help you to set a schedule.

Achieving MES Success Together

10. Take Advantage of the Knowledge Potential of an MES Workshop.

An MES workshop helps you to get to know your own expenses and to create the specification sheet with which you can obtain comparable offers. A workshop with the MES provider of your choice is useful in order to demonstrate the benefits and advantages of an MES as well as the associated changes to all those involved in the project, while at the same time assessing your own efforts and ultimately, receiving a binding offer from the MES provider. An agenda is worked through and all of the details essential for your MES project are discussed. As a rule, you will then receive detailed documentation or a specification sheet.



"You will surely not realize it just from these ten tips, the introduction of an MES is an important and complex project that ties up resources in the company and costs quite a bit.

However, the MES benefit is significantly higher and lasting much longer than the effort you have to put into the implementation. The economic success of the MES solution can be increased by a number of measures, such as carefully prepared concepts and project plans, the early involvement of all stakeholders, and careful training and support of your employees during the implementation. Don't be afraid to ask your MES provider for support – they have experience and helpful information.

Before you decide on an MES provider and its solution, we also recommend that you take a look at the company's references. You may be able to make a reference visit to a company that positions itself similarly to yours and benefit from their experience with MES implementation."

Dr. Karl-Heinz Gerdes
Founder of FASTEC GmbH

MES

The Complete Industry 4.0 Whitepaper Series From FASTEC

FASTEC provides manufacturing companies with MES solutions for discrete manufacturing. As a leading MES provider, FASTEC has implemented a wide range of customized solutions in many projects since it was founded in 1995 – each unique in terms of the production processes and manufacturing methods involved. Our systems are used nationally and internationally in various industries.

We work in a practice-oriented, efficient manner and ensure that our projects lead to lasting benefits for our customers. Together with you, we develop suitable solutions for your requirements, which we then implement precisely, quickly and cost-effectively on the basis of our MES standard software, which can be configured in many ways. Our customers benefit from our wide range of experience. In the end, there is a result that convinces our customers: A flexible and easily expandable system with sophisticated functions. FASTEC users are enthusiastic about the numerous features of the software and its usability in everyday use.

Decide on FASTEC 4 PRO – for a custom-fit MES solution with maximum customer benefit.

We take you on a journey into digital manufacturing; our whitepaper series serves as a guide.

- Step 1:** What Is Industry 4.0? Where Is the Journey Heading?
- Step 2:** **How Do I Find the Right Partner on the Way to Industry 4.0?**
- Step 3:** **10 Tips for MES Implementation – What You Should Keep in Mind.**
- Step 4:** Focus on Transparency:
The Modules MDA, PDA, Monitoring Etc.
- Step 5:** Focus on Optimization:
Key Figures and How to Work With Them.
- Step 6:** Focus on Traceability:
The Many Unknown Benefits.
- Step 7:** Focus on Planning:
Save Time and Resources With Effective Planning.
- Step 8:** Functional Networking as the Basis of the Self-Regulating Factory.



Stay Competitive in the Long Term – With Us.

FASTEC GmbH is based in Paderborn, Germany and specializes in the digitalization of production processes based on the in-house developed Manufacturing Execution System (MES) FASTEC 4 PRO. The modular standard software can be configured across industries, is compatible with future releases and operated intuitively.

FASTEC has been accompanying its customers on their way to digital transformation since 1995. Around 400 companies in over 20 countries use FASTEC 4 PRO in over 10,000 production facilities. Work processes are optimized and costs are reduced in the long term thanks to the holistic digitalization of production.

We would also like to give you a good advice personally!

Our sales department will be happy to provide you with further user reports and information material! Or else, make an appointment with our sales department for a presentation at your location, in our company or via web. Of course, you can also experience FASTEC 4 PRO live and on site with our customers.

vertrieb@fastec.de or by phone at **+49 5251 1647-0**

Additionally, we offer videos of our software and customer solutions in our YouTube channel:

www.youtube.com/FASTECGmbH

FASTEC GmbH
Technologiepark 24
D-33100 Paderborn
+49 5251 1647-0
info@fastec.de
www.fastec.de

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