



Solutions for Factory Plant Control



doeet 

The MES/MOM solution
for Industry 4.0

Doeet is one of the leading Industry 4.0 solutions for industrial digitalisation, production control, productivity improvement and cost reduction.

Doeet collects your manufacturing data in real time: production, productivity, quality, traceability, costs, maintenance and analyzes machine and operator information: downtime, units produced, consumption, scrap, wastage and rejects.



More than

20

years of
experience

More than

40

consultants
and technicians

More than

400

customers

Solutions for Factory Plant Control

An advanced MES system like doeet has the necessary functions to **comprehensively control all the processes in your production plant**.

The MES functions of the doeet system allow you to **control through reports and graphics the status of all production orders in real time**, their life cycle, quality controls or the consumption of raw materials made on the product being manufactured or finished.

Doeet **collects information from machines and operators automatically** by means of PLC cards, including manual jobs and external operations not associated with the machine by means of doeet HMI terminals.

Know your real productivity by means of universal OEE indicators for availability, performance and quality, with the aim of **optimising manufacturing processes and reducing costs**.

Among the doeet **Solutions for Factory Plant Control** we highlight the modules and functions of **Quality Control, Visual Factory, Calculation of OEE , CMMS Maintenance, Manufacturing Parameters, External Operations and Auto-stops**.





QUALITY
CONTROL



VISUAL
FACTORY



CALCULATION
OF OEE



CMMS
MAINTENANCE



MANUFACTURING
PARAMETERS



EXTERNAL
OPERATIONS



AUTO-STOPS



QUALITY CONTROL

Establish each quality control to be completed by the operator and analyze the collected production data.

Create **your quality control plan**

Create and edit the **different quality control plans** to be completed by the operator in the factory plant. Add and group the required controls and data to each plan.

You can create quality plans for specific activities such as a **machine start-up, order or reference change**.

Design **your checklists** for operators and items

Incorporate **selection checklists, lists, and numerical or text inputs** with the data you want to collect from production: **raw materials, machine parameters, or checks**, and these will be assigned to **lines, machines, references or operators**.

You can also generate **specific controls** for certain references and machines.

- Create your quality controls for products, machines or operators.
- Program and associate specific controls according to your end customer's requirements.
- Real-time review of out-of-range quality controls.
- Reduce non-conformities and defective units.



Compatible with external measuring devices

Doeet connects to any external device such as **check weighers, scales, machine vision systems** or to the machine itself, to make **manual or automatic records** of any quality variable or manufacturing parameter.

Real-time quality

Check and analyze in **real-time** the quality records or machine parameters, obtained manually or automatically, using **PLC cards, scales, machine vision systems** and other measuring and control devices.

Doeet generates a graph with the data recorded for each variable, its **nominal value** and **minimum and maximum allowable value**. We can limit the results to a specific period.

Create operator alerts and warnings

Activate the controls for each plan and indicate to which section, machine, item or order they should be associated. You can indicate that they are activated every certain time or every number of units produced.

A warning shall appear on the operator terminal indicating that a check has to be completed: at the start or end of the order or persistently. The quality controls are designed to be completed **quickly and easily** by the operator.

FUNCTIONS

- ✓ Creation of quality controls for products, machines or operators.
- ✓ Assignment of quality controls to operations and references.
- ✓ Fulfilment of the controls in HMI's by the operator in the factory plant.
- ✓ Quality control reports and charts.
- ✓ Quality variables with range of tolerances.
- ✓ Control of measuring equipment.

Analyze and reduce your quality problems

Doeet automatically counts the **defective units** and associates them with the quality controls carried out in the factory plant. All data is recorded in the quality variables report to **analyze the factors that affect the quality of your final product**.

QUALITY CONTROL AT THE OPERATOR TERMINAL





VISUAL FACTORY

The visual factory improves the operability of production using real-time information panels.

All data in **full view of everyone**

The doeet Visual Factory module allows you to generate **large-format projections and screens** with data on the status of manufacturing, to be **viewed by all factory plant personnel**.

The displays show **machines running or stopped**, the **status of production orders** or the **overall efficiency of the equipment**.

Improve your **processes** with **information**

Communicate the **status of your production** by displaying in real time the status of all your machines. View your Visual Factory dashboards **from any mobile device and any location**, even off-site.

Sharing production status with your operators **avoids organizational problems** and improves the involvement of all personnel.



Visually monitor the status of your production at all times.

Customize the relevant data to be displayed to operators.

Share with the different operational areas what is happening in the factory.

Immediately report any production issues for a quick solution.



Visual factory with customizable panels

The objective of the visual factory is to provide **reliable, up-to-date and functional information** to improve the operability of production.

Five screen formats are available with different production data, from machine status and production orders to overall equipment efficiency, along with a colour legend defining asset statuses.

Create customized dashboards with the production data you need, **automatically updated** and focused not only on displaying relevant information but also on improving operability.

FUNCTIONS

- ✓ Display of panels with relevant production data and graphs.
- ✓ Visualization of production data in the factory plant or the office.
- ✓ Customization of the data displayed in the panels.
- ✓ Machine status indicators: stop, running, low speed.
- ✓ Visualization of the OEE productivity of each machine: availability, performance and quality.



Visual machine status factory

A grid with sections represents the machines of the production factory. The colour indicates the status of each machine: green in standby, red in shutdown, grey non-operational, orange in standby and blue in failure.

We can incorporate secondary data for each machine, such as the current downtime or the production order on the machine.

EFICIENCIA GENERAL DE EQUIPOS				
MÁQUINA	OEE	DISPONIBILIDAD	RENDIMIENTO	CALIDAD
GLOBAL	36.54%	36.54%	100%	100%
EXTRUSORA 1	92.427%	92.427%	100%	100%
EXTRUSORA 2	98.831%	98.831%	100%	100%
CELULA MANUAL 1	0%	0%	100%	100%
CELULA MANUAL 2	0%	0%	100%	100%
CELULA MANUAL 3	0%	0%	100%	100%

Overall equipment efficiency

Visualize in different bar graphs the current values of the universal production KPIs: the actual OEE efficiency, availability, performance and quality of each machine.

The display shows the values of the OEE indicators for all lines and compares them with the target values specified in the system.

ÓRDENES FINALIZADAS				
ID	MÁQUINA	FECHA	DESCRIPCIÓN	CANTIDAD
2819	807 68	10/08/20	ADRAL PVC 6X1 T (DOMAL B-2186/C24)	2378
8819	807 68	10/08/20	PVC UNIPAL.BOTE METAL 1L (812)	1872
8821	807 67	10/08/20	WORTH AD PVC BOTE 1L PNC31 (84)	3429
10149	807 281	10/08/20	REPLUMB ADH PVC BOTE PL 250ML PNC38	3481
11119	807 68	10/08/20	WE EXPERT ADH PVC TF BOTE PL 250ML (814)	2303
12188	807 68	10/08/20	PVC UNIPAL.BOTE METAL 1L PNC31 (812)	5128
19140	807 281	10/08/20	REPLUMB ADH PVC BOTE PL 250ML PNC38	8128
21127	807 68	10/08/20	POM PLASTIQUEI AD PVC TF PNL.BOTI(812)	2481
88139	807 68	10/08/20	PVC PEGADOR.BOTE METAL 1L PNC31 (812)	1604
11129	807 68	10/08/20	POM PLASTIQUEI AD PVC TF PNL.BOTI(812)	8763
88138	807 68	10/08/20	PVC G-16 BOTE METAL 1L PNC31 (812)	1524
87139	807 67	10/08/20	TANERPLAT ADH PVC BOTE(100ML)PNC31(78)	775

Panels of orders completed or pending be manufactured

These screens show, in a table format, the completed production orders, the next orders to be completed and the next orders to be produced. We can know for each order the start time, the machine, the item and the current quantity of good units produced.



CALCULATION OF OEE

Measure the overall efficiency of machines and operators with the calculation of OEE in production and productivity KPIs.

Know your **real productivity**

OEE in production (Overall Equipment Efficiency) provides a **global view of the productivity losses** that occur during manufacturing processes.

The **OEE** doeet system collects all the data from your production lines and executes the necessary calculations to obtain the **OEE, availability, performance and quality** values, their deviation from their target value and their evolution over time.

Measure, manage, **improve** your OEE in production

Know exactly which **OEE indicator** is affecting your production efficiency **when it occurs and for what reason**.

Analyze the actual evolution of the productivity indicators and compare them with the established objectives. So you will be able to know if **a drop in production is due to a downtime or speed problems in the machines, or quality problems in the final product**.

- Analyze your production in real time with OEE indicators.
- Filter production data by line, reference, order or shift.
- Know the hours of walking and stopping, their causes and frequency.
- Know the actual units manufactured on each production line.
- Diagnose in which shift the speed drops of the operator or the reference.
- Analyze your quality and the reasons for defective units.



Control downtime on your lines

Analyzing the most common **causes of the machine and operator downtimes** and taking measures to avoid them will **increase the availability** of your machines and operators and **improve your productivity**.

Customize the most common **causes of stoppages** in your production and group them into categories; so that it's easy for the operator to rapidly **justify the stoppage at the machine** via the doeet terminal.

Your factory at high performance

Doeet **automatically counts all units produced** through sensors integrated into the machines or external PLC cards.

The system **recognizes the changes in times of references and calculates the average speeds** for each one and their deviations from theoretical speeds so that you know your precise performance.

Manufacture without defects and without scrap

Count the **products without defects** against the total number of products manufactured, **know the causes of failures** and take measures to reduce them and avoid rework.

Quality losses involve both energy and raw material costs as well as production time and reprocessing losses, in addition to the cost of discarding or recycling defective units.



FUNCTIONS

- ✓ Analysis of the global state of production with OEE indicators.
- ✓ Comparison of actual and theoretical production data and their evolution.
- ✓ Calculation of costs due to downtime or loss of yield and quality.
- ✓ Control of machine and operator status: running, stopped, non-operational, and analysis of causes of stoppages.
- ✓ Registration of units per machine, hour, reference, and operator.
- ✓ Justification of defective units and analysis of scrap causes.

All your data at a glance

Doeet has several predefined productivity reports ready to start analyzing your production: OEE, availability, performance and quality. Reports are designed to range from **general analysis to particular detail** in a few clicks.

Customize and **filter all your production data by line, reference, order, and shift**, to study in more detail the causes of lost productivity.

100% reliable and real-time data

Doeet obtains data directly from the machines (running times, downtime, units produced) so that production records are reliable and cannot be manipulated.

Knowing in **real-time and reliably the drops in production and their causes** enables us to take measures aimed at improving productivity. Once the measures have been implemented, we will review the data to verify if we have solved the problem.



CMMS MAINTENANCE

Manage and plan the CMMS maintenance of your plant and avoid shutdowns due to breakdowns, lack of maintenance or spare parts.

Open **corrective orders** quickly

Unintentional failures and breakdowns have a major impact on production processes because they cannot be planned for. What we can do is to have a **rapid response to minimize its effects**.

Open a corrective work order in just a few clicks **when a critical failure occurs on your machines**. Fill in the critical data and **the mechanic will immediately receive the corrective maintenance order on his HMI**.

Assign your mechanics each task

Create **users with different levels of permissions** for maintenance management and assign them to your staff: from administrators with full control to mechanics who can only see the maintenance orders assigned to them.

- Create your preventive plans for machines or lines.
- Create corrective commands in the event of an unforeseen failure.
- Assign maintenance to your mechanics.
- Associate manuals and checks to maintenance.
- Manage the stock of your spare parts warehouse.
- Analyze costs, time spent, MTBF or MTTR.



Schedule your preventive maintenance

Create the necessary preventive maintenance programs for all your machines and installations simply and efficiently. Good preventive maintenance aims to **reduce breakdowns and downtime** to improve productivity and reduce costs.

Indicate the frequency of preventive maintenance. **Maintenance orders are automatically generated** and assigned to the corresponding mechanic. The orders will appear in the mechanics' task list on the date indicated and with the corresponding priority.

Keep track of your spare parts at all times

Warehouse and stock management controls the quantity, status and location of all spare parts and materials required for your maintenance. Register each spare part in the system and incorporate detailed and useful information such as **cost, supplier, technical specifications** or user manuals.

When repairing a machine, the **consumed spare parts are automatically accounted for**, so that we control the stock of available spare parts and know in advance when they need to be replaced.

Associate documents and checks to CMMS maintenance

Associate files of all types with maintenance orders. In this way, we can associate documents such as an installation or maintenance manual, photos or videos to an order. We can also incorporate functions such as control of machine parameters, which we can verify later.

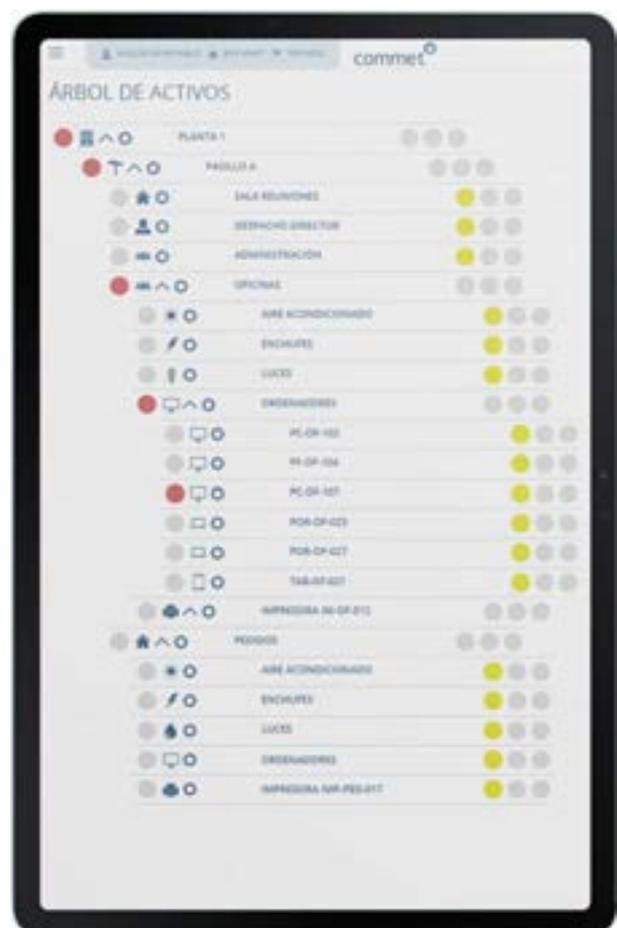
In this way, the mechanics have all the information they need to repair the breakdown and leave the machines ready and in optimum condition for production.

A complete CMMS maintenance analysis module

Analyze in depth all the key factors of your maintenance, such as the hours spent, personnel and spare parts costs, or the number of orders executed per type of maintenance or machine.

FUNCTIONS

- ✓ Creation of preventive maintenance plans and programs.
- ✓ Quick creation and assignment of corrective maintenance.
- ✓ Assignment and management of maintenance orders to mechanics.
- ✓ Registration of users, levels and permissions.
- ✓ Maintenance reports by type, and costs.
- ✓ Spare parts stock control.



MACHINE TREE VIEW



MANUFACTURING PARAMETERS

Control of manufacturing and critical parameters to avoid bad units due to machine failures or misalignments.

Monitor **key** manufacturing control **parameters**

Analyzing machine variables and their records is essential for **detecting deviations** in the production process, machine downtime and **avoiding the manufacture of defective units**.

Define the set of **variables that affect your production** and monitor machine parameters such as **temperature, pressure or power** in real-time. Configure as many manufacturing parameters as you need and link them to the corresponding machines.

Parameters **associated with the production order**

Doeet associates the manufacturing parameters to the current work order and the events recorded during its reading.

The **inverse analysis** allows knowing if the machine parameters were correct during the execution of the order, or if any variable was out of range and has caused the production of defective units.

- Set up manual and automatic records of your critical manufacturing parameters.
- Real-time graphical monitoring of parameter values.
- Set warnings and alarms for early detection of faults and malfunctions.
- Reduce your scrap, waste and rework by manufacturing with out-of-range parameters.



Enable **automatic records** and don't lose any data

By enabling an auto-recording, the variables associated with the machine are **automatically recorded in the doelet system** by the sensors connected to the PLC.

We can group variables and configure their **checking and logging frequency**.

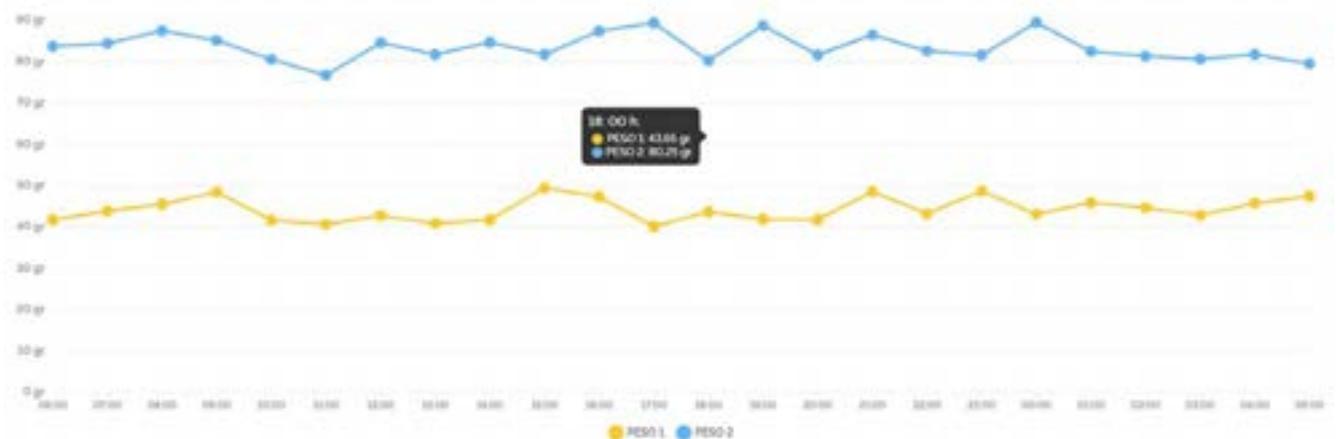
Visual **graphics** for each manufacturing control

Doelet **generates control charts** with the values taken by each of the variables and their evolution over time.

All this information can be accessed from the **manufacturing parameters report** or operator HMI.

FUNCTIONS

- ✓ Classification of production variables: temperature, pressure, current.
- ✓ Association of records to production orders, raw materials, and batches.
- ✓ Generation of reports and control charts in real-time.
- ✓ Alerts and alarms based on a maximum and minimum range of tolerances.
- ✓ Display of machine parameters on the operator terminal.
- ✓ Automatic recording of parameters.
- ✓ Historical records of the variables.



CONTROL CHART OF MANUFACTURING VARIABLES

Create **warnings and alerts** for out-of-range parameters

Create a serie of alarms that are triggered when any machine parameter falls outside a **defined minimum and maximum tolerance range**.

When the alarm is activated, it will display a **warning on the operator terminal** when the parameter goes out of the optimum range set for production. This way we avoid producing bad units due to **machine failures or misalignments**.





EXTERNAL OPERATIONS

Activate the operators control in manual tasks, whether associated with a machine or not and know in real-time if they are finished.

Operators Control and **any type of production operation**

The doeet External Operations module allows you to effectively control **manual tasks on the shop floor**, whose efficiency is often overlooked. Control auxiliary operations such as **cleaning or support tasks for the production process**.

The operator simply selects the task from a list previously configured for each factory location. The system records **the status of the activity and the number of hours spent** performing that task.

Accessible through **any device**

The external operations module is specially designed for **use with PDA, mobile or HMI** so that the operator can carry it with him at all times and in a comfortable way.

Its design is **simple, intuitive and customizable** to the specific operations to be performed in each factory.

- Create manual tasks for each location or production order.
- Control the timing and efficiency of factory operations.
- Measure productivity per operator to apply incentives.
- Simple and intuitive interface adapted to PDA, HMI and/or smartphones.
- Compatible with all doeet extension modules.



Associate operators control to a manufacturing order

Control operations related to a manufacturing order without allocating manufactured products.

In this way, you can precisely control operations performed on the machine which do not add value to production, such as setting machines or performing quality controls.

Allocate units produced to order-related operations

Doeet allows controlling manual operations in which the manufactured product is declared. In this way, the product's cost evaluation is considered and parameters such as the hours charged by each operator, raw material consumed and units manufactured are calculated.

This mode is useful for manual tasks such as manual boxing or packaging, assembly, etc.

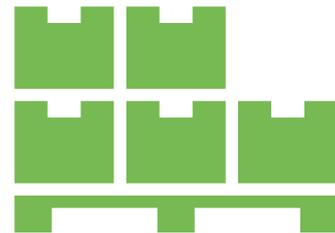
Activate the advanced traceability

External operations functions can be connected to the advanced traceability module, and incorporate its functions for complete control of raw materials and finished products.

In this way we can measure the actual consumption and production of any process to calculate raw material yields, obtain the actual pallets manufactured and know our stock in real time.

FUNCTIONS

- ✓ Creation of manual operator tasks by location or order.
- ✓ Allocation of hours dedicated to external machine operations.
- ✓ Control of tasks with or without associated production orders.
- ✓ Complete and paperless recording of all manual operations.





AUTO-STOPS

Create your auto-stops system to automatically justify machine stops by indicating their causes.

Justify stoppages **automatically**

The Auto-stops doeet module allows setting a serie of conditions so that **the machine's alarms automatically justify a machine stop**.

This is especially useful when a stoppage may occur, the cause of which the operator does not know how to identify. The system will detect and display the cause on the terminal, self-justifying the shutdown.

Configure your **shutdown system**

Configure the different **systems and subsystems** to which the shutdowns are linked. There can be several subsystems depending on the same system, which will occur if they are extensive process lines, or if we have machines divided by sections. It can also be applied to give **priority** to some subsystems over others.

Indicate the **shutdown lockout times**, which is the time in seconds that the system or subsystem stores the signal to self-justify the shutdown.

Configure your **auto-stops**

First, we must create a **cause of stoppage with which we associate the auto-stop**. We will indicate the machine to which it applies and its identification code, and if we want it to be visible to the operator.

It identifies each shutdown, indicates the subsystem to be associated, **its code, priority and blocking time**.

Activate the alarms if you want the **operator to be alerted** every time a shutdown is automatically registered. You can reset the auto-stops to reset all currently active ones.

- Reduce operator intervention time with the system.
- Know the reality of the condition of your machines with the self-justification of shutdowns.
- Check through the associated report for the alarm reasons for your equipment.

States of stoppages

The states represent the **signal labels of the machines** in question: **Active, fault, warning or running**.

We will indicate for each state the initial and final bit or if it is reset, in addition to the appropriate observations. After configuring the auto-stop, we must **create a stop as an auto-stop** and associate them using their code.

See the **auto-stops report**

Doeet generates reports that **associate the auto-stops with the variables** configured in the system.

The table of variable states or self-justification shows the combination of **auto-stops and self-justifications** for each subsystem. The report also shows the tags or machine states in the system.

FUNCTIONS

- ✓ The automatic signal capture from the machine's PLC justifies the stop and its cause.
- ✓ Creation of customized auto-stops.
- ✓ Generation of specific Auto-stop reports.

Some of the customers
who already trust doeet





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