



Infor Forcam MES Maintenance Booking

Version 5.11

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About this guide

Intended audience

Organization

This table shows the chapters of the guide:

| Section | Description |
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Related documents

You can find the documents in the product documentation section of the Infor Support Portal, as described in "Contacting Infor" on page 5.

Contacting Infor

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Chapter 1 Concept

If machine malfunctions occur, Infor Forcam MES provides the option to request maintenance via the shop floor terminal. In doing so, the malfunction report is sent to the maintenance via ERP.

The repair personnel process the maintenance order and finish the repair. The machine malfunction is eliminated this way and the production continues.

The maintenance process is displayed in Figure 1. The according change of phases and statuses is summarized in Table 1 (see below).

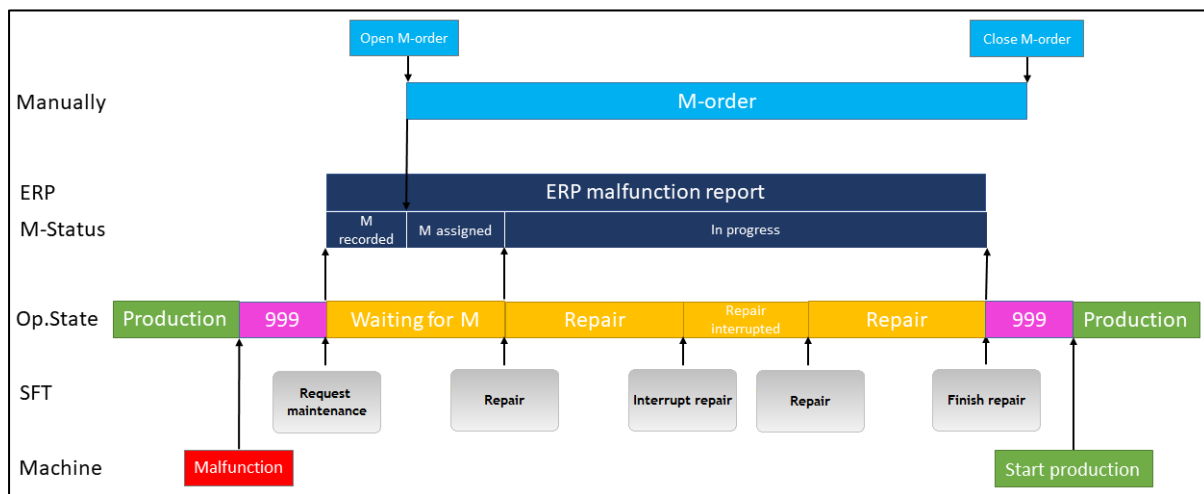


Figure 1: Maintenance process from the ticket to the elimination of the malfunction

Figure 1 is based on the following process:

- A machine malfunction occurs.
The workplace status changes from **Production** to Undefined stoppage **with the mnemonic 999**.
- The operator is unable to eliminate the malfunction on his own.
- The operator pushes the button **Request maintenance in the SFT** and by doing so requests maintenance.
The workplace status changes to **Waiting for maintenance**.
A malfunction report is created in ERP. The status of the malfunction report is **Recorded**.
- A maintenance order is generated in ERP.

A maintenance technician is determined. The status of the malfunction report changes to **Assigned**.

- The maintenance technician opens the maintenance order.
- The maintenance technician pushes the button **Repair in the SFT**.
A ticket is sent to ERP. The status of the malfunction report changes to **In progress**.
- All MDE machine signals are ignored during the repair, so that the machine can be turned off and on as needed.
- The maintenance technician can push the button **Interrupt repair in the SFT**.
- The maintenance technician finishes the repair and pushes the button **Finish repair in the SFT**.
The workplace status changes to **Undefined stoppage**.
A ticket is sent to ERP. The malfunction report in ERP is finished.
- The maintenance technician finishes the maintenance order.
- The production continues on the machine. The workplace status changes to **Production**.

The following Table 1 describes the change of phases and statuses during maintenance based on the process shown in Figure 1:

Table 1: Change of phases and statuses during maintenance

| Status | Production | Undefined stoppage | Waiting for maintenance | Repair | Repair interrupted | Repair | Undefined stoppage /Production |
|-------------------------|------------|--------------------|-------------------------|----------------------------------|----------------------------------|----------------------------------|--------------------------------|
| Machine status | Production | Downtime + R1 | Downtime + R1 | Downtime/production (suppressed) | Downtime/production (suppressed) | Downtime/production (suppressed) | Downtime/production |
| Workplace Status | Production | Downtime | Waiting for maintenance | Maintenance | Maintenance interrupted | Maintenance | Downtime/production |
| Workplace Phase | Production | Production | Production | Production | Production | Production | Production |
| Operation Status | Production | Downtime | Waiting for maintenance | Maintenance | Maintenance interrupted | Maintenance | Downtime/production |
| Operation Phase | Production | Production | Production | Production | Production | Production | Production |
| Operating state | Production | R1 | Waiting for maintenance | Maintenance | Maintenance interrupted | Maintenance | Downtime/production |

The maintenance ticket is realized via two activity steps:

The first step is executed by the operator and requests maintenance.

The second step is executed by the maintenance technician and changes the maintenance status.

The configuration of a superordinate button is required.

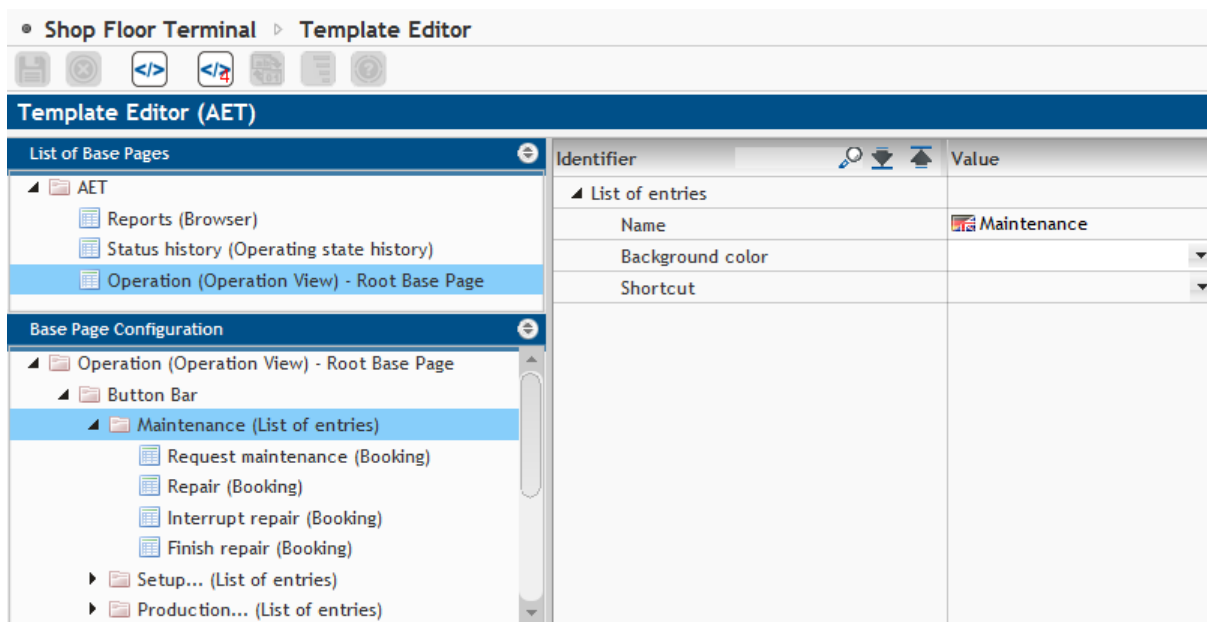


Figure 2: Button maintenance with subdivided activity steps

Chapter 2 Request Maintenance

To request maintenance, the operator presses the button with the configured activity step in the shop floor terminal (see below).

The activity step to request maintenance is **Maintenance request**.

This step opens a dialog, in which the operator enters the following data:

- Operator
- Time stamp of request
- Workplace (equipment number)
- Mnemonic of the current operating state
- Text or name, respectively, of the current operating state or the malfunction, respectively
- Remark of the operating state or the malfunction, respectively
- Request ID (optional)

After sending the dialog, the current downtime is automatically split (subdivided). The downtime before the split is coded according to the state entered in the dialog. The status after the split becomes **Waiting for maintenance**.

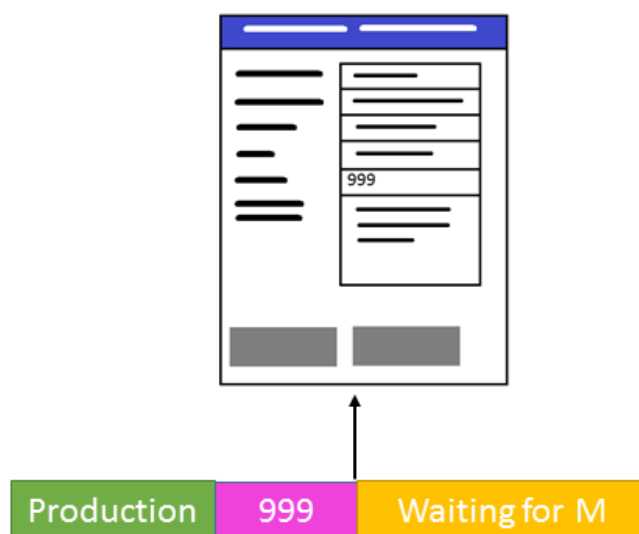


Figure 3: Change of the operating state after requesting maintenance

The following Table 2 contains all configurations needed in this step:

Table 2: Values of the activity step maintenance request

| Identifier | Value |
|------------------------------------|---|
| Input parameter | Workplace (WORKPLACE) – Workplace (APL) Person (PERS) – Person (PERS) |
| Person information required | Optional: If a check mark is set, the step requires the indication of a personnel ID to execute. |
| Ticket class | Simple comment |

| Identifier | Value |
|---------------------------------------|---------------------------------------|
| Request a maintenance | |
| mDoNotCancel | false |
| Activity step name | Request maintenance |
| Configuration of execution conditions | |
| Input parameters | (2) List Elements |
| Parameter assignment | Workplace (WORKPLACE) Workplace (APL) |
| Parameter assignment | Person (PERS) Person (PERS) |
| Output parameters | (0) List Elements |
| Person information required | <input type="checkbox"/> |
| Ticket class | Simple comment |

Figure 4: Configuration of the activity step maintenance request

The main dialog box, titled 'Request maintenance', contains the following fields:

- Time of request:** 1/27/17 5:53:46 PM
- Workplace:** 25810256/Schenk 050 FBLS
- Operating State:** Defect incoming parts
- Abbreviation:** 1000
- Comment:** All incoming parts are defect

Buttons on the right include '(ESC) Cancel' and '(F1) OK'. A red callout box highlights the 'Request maintenance' button in a menu structure on the right, which also includes 'Repair', 'Interrupt repair', 'Finish repair', 'Maintenance', and 'Setup...'.

Figure 5: Dialog to request maintenance

Chapter 3 Repair

To conduct maintenance, the maintenance technician presses several buttons with the accordingly configured activity step in the shop floor terminal (see below). The activity step for the repair is **Changing the maintenance status**. The step is configured in a way that the maintenance adopts the according status that corresponds with the button.

The following buttons should at least be created:

- Repair
The maintenance technician starts the repair.
- Interrupt repair (optional)
The maintenance technician has the option to interrupt the maintenance, e.g. to supply necessary tools. The interruption enables a more precise recording of the actual maintenance duration.
- Continue repair (optional)
The maintenance technician continues the maintenance.
- Finish repair
The maintenance technician eliminated the malfunction. The maintenance is finished.

Start Repair

The maintenance technician starts the problem solving at the machine. He presses the button **Repair** in the shop floor terminal. The operating state changes from **Waiting for maintenance** to **Repair**.

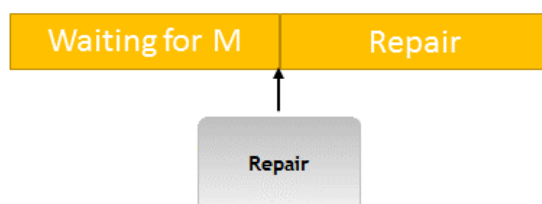


Figure 6: Changing the operating state at the start of the repair

When activating the step, a malfunction report is sent to ERP. The duration of the repair is recorded or booked, respectively, from this time on.

All MDE machine signals are ignored during the repair, so that the machine can be turned off and on as needed.

The following Table 3 contains all configurations needed in the step:

Table 3: Values of the button Repair

| Identifier | Value |
|---------------------------|------------------------------------|
| Input parameter | Workplace (WORKPLACE) – Workplaces |
| Maintenance status | Maintenance |

| Identifier | Value |
|---|----------------------------------|
| ▲ Maintenance status change | |
| Activity step name | Repair |
| ► Configuration of execution conditions | |
| ▲ Input parameters | (1) List Elements |
| Parameter assignment | Workplace (WORKPLACE) Workplaces |
| Output parameters | (0) List Elements |
| Maintenance status | Maintenance |

Figure 7: Configuration of the button Repair

Interrupt and Continue Repair

The maintenance technician is unable to continue the repair, e.g. because he needs spare parts or support. He presses the button **Interrupt repair** in the shop floor terminal. The operating state changes from **Repair** to **Repair interrupted**.

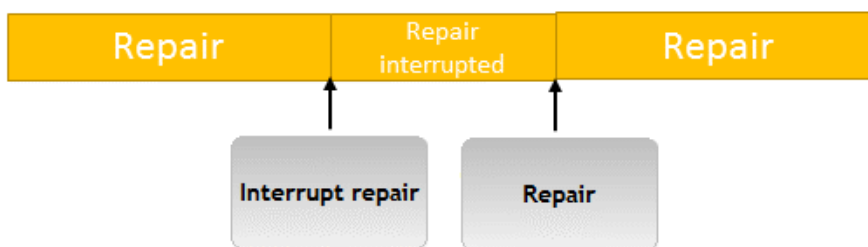


Figure 8: Interrupt and continue repair

The ERP malfunction report is not interrupted during the interruption of the repair. The interruption of the repair merely records the time in which the maintenance in fact continues, but nobody actually works on the problem solving.

The maintenance technician presses the button **Repair** to continue the repair (see section 3.1). The status changes again to **Repair**.

The following Table 4 contains all configurations needed in the step:

Table 4: Values of the button Interrupt repair

| Identifier | Value |
|---------------------------|------------------------------------|
| Input parameter | Workplace (WORKPLACE) – Workplaces |
| Maintenance status | Maintenance Interrupt |

| Identifier | Value |
|---|----------------------------------|
| ▲ Maintenance status change | |
| Activity step name | Interrupt repair |
| ► Configuration of execution conditions | |
| ▲ Input parameters | (1) List Elements |
| Parameter assignment | Workplace (WORKPLACE) Workplaces |
| Output parameters | (0) List Elements |
| Maintenance status | Maintenance Interrupt |

Figure 9: Configuration of the button Interrupt repair

Finish Repair

The maintenance technician finishes the problem solving on the machine. He presses the button **Finish repair** in the shop floor terminal. The operating state changes from **Repair** to **Undefined stoppage** with the mnemonic **999**.

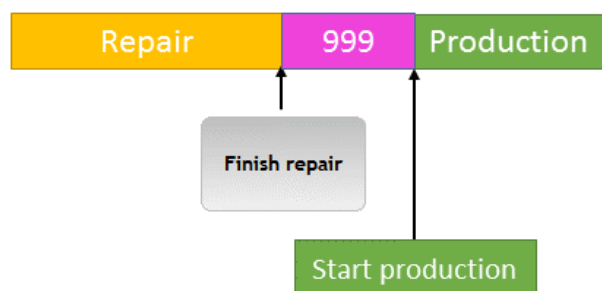


Figure 10: Finishing the repair

When activating the step, a ticket is sent to ERP that finishes the malfunction report.

As soon as the machine reports the production start, the status changes back to **Production**.

The following Table 5 contains all configurations needed in the step:

Table 5: Values of the button Finish repair

| Identifier | Wert |
|---------------------------|------------------------------------|
| Input parameter | Workplace (WORKPLACE) – Workplaces |
| Maintenance status | No Maintenance |





| Identifier | Value |
|---|--|
| ▲ Maintenance status change | |
| Activity step name |  Finish repair |
| ▸ Configuration of execution conditions | |
| ▲ Input parameters |  (1) List Elements |
| Parameter assignment | △ ▽ Workplace (WORKPLACE)  Workplaces ▾ |
| Output parameters |  (0) List Elements |
| Maintenance status | No Maintenance ▾ |

Figure 11: Configuration of the button Finish repair

Chapter 4 Logic Components

To be able to configure the maintenance ticket, the runtime has to be supplemented by according logic components. This section lists all necessary logic components and their functions.

MAINTENANCE STATUS BASED EVENT FILTER

The logic component **MAINTENANCE STATUS BASED EVENT FILTER** filters machine events based on specific maintenance statuses. The logic component has to be inserted in the Real-Time-Preprocessing-Process.



Figure 12: The logic component MAINTENANCE STATUS BASED EVENT FILTER in the process flow

The logic component requires the following configuration:

- **eventName:**
Class name of the event that can be filtered out. Possible values:
 - MachineStatusEvent
 - MachineStrokeEvent
 - MachineQuantityEvent
 - MachineCountEvent
 - MachineCounterArrayEvent
- **Status code of the maintenance:**
Code of the maintenance that controls the filter. Possible values:
 - 1 (No maintenance)
 - 2 (Waiting for maintenance)
 - 3 (Maintenance)
 - 4 (Maintenance interrupted)

The logic component is usually used to suppress quantity messages of the machine during the maintenance.

MAINTENANCE STATUS

The logic component **MAINTENANCE STATUS** sets maintenance status according to the events WorkplaceMaintenanceRequestEvent and WorkplaceMaintenanceStatusEvent. The logic component has to be inserted in the Core-Process.

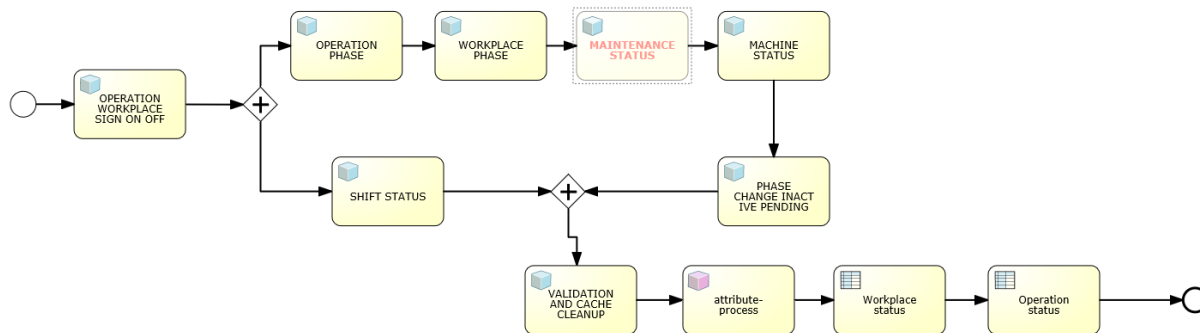


Figure 13: The logic component MAINTENANCE STATUS in the process flow

The maintenance status can have the following values:

- 1 (No maintenance)
- 2 (Waiting for maintenance)
- 3 (Maintenance)
- 4 (Maintenance interrupted)

The initial status is **No maintenance**.

MAINTENANCE REPORTING

The logic component **MAINTENANCE REPORTING** generates maintenance tickets to ERP to request, start and finish maintenance. It thereby encloses the whole maintenance process.

An ID is generated for each maintenance and is included in each maintenance ticket. The ID is recorded in the logic component **MAINTENANCE STATUS**. Therefore, **MAINTENANCE REPORTING** depends on **MAINTENANCE STATUS**.

An event of the type WorkplaceMaintenanceRequestEvent triggers a ticket to request maintenance.

An event of the type WorkplaceMaintenanceStatusEvent triggers a ticket to start/finish maintenance.

The logic component has to be placed in the ERP process (ERP downstream).

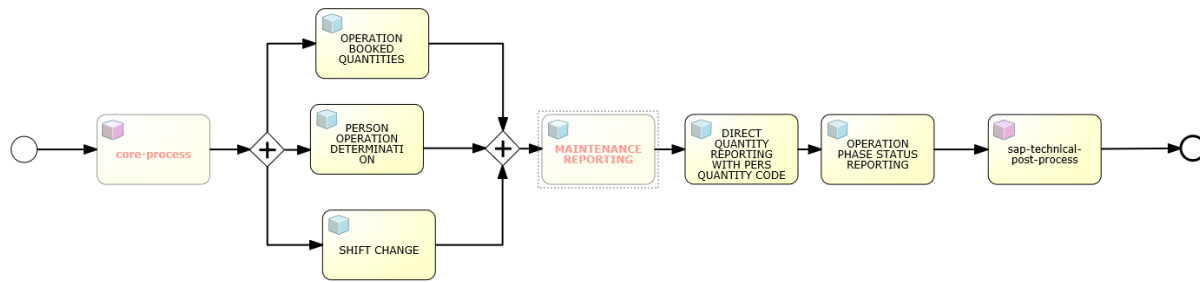


Figure 14: The logic component MAINTENANCE REPORTING in the process flow

Chapter 5 Field Definitions for IDoc Generation

To activate the necessary actions in SAP and document the maintenance duration, the following IDocs are defined.

Request Maintenance

Table 6: IDocs for RequestMaintenance /FFMES/REQPM

| Name in ERPUpload.xml | Length | Meaning | Source in Infor Forcam MES |
|-------------------------------|--------|---|--|
| SART | 5 | Parameter | |
| NOTIFICATION_TYPE | 2 | notification type | set in FFWorkbench: status reason --> Customer Code |
| EQUIPMENT | 18 | equipment number | set in FFWorkbench: machine --> equipment number |
| REPORTER_ID | 12 | reported by | person --> personnel number |
| MALFUNCTION_COMMENT | 40 | short description of malfunction | status reason --> short description or manual worker input (if entered) |
| MALFUNCTION_START_DATE | 10 | malfunction start data (format:dd.MM.yyyy) | fetches from cache |
| MALFUNCTION_START_TIME | 6 | malfunction start time (format: HHMMSS) | fetches from cache |
| MALFUNCTION_CODE | 4 | damage code | status reason --> mnemonic |
| MALFUNCTION_CODE_GROUP | 8 | damage code group | status reason --> mnemonic (assumption: code and code group always the same) |
| MES_PM_ID | 12 | MES id number for referencing maintenance request | generated in SFT during creation of request, fetched from WorkplaceMaintenanceRequestCommand |
| MATERIAL_NUMBER | 40 | material number | fetched from cache (if available): operation --> material --> material number |
| MATERIAL_DESCRIPTION | 40 | material description | fetched from cache (if available): operation --> material --> getDefaultTranslation |

Start Maintenance

Table 7: IDocs for StartMaintenance /FFMES/CHGPM

| Name in ERPUUpload.xml | Length | Meaning | Source in Infor Forcam MES |
|-------------------------------|--------|---|--|
| SART | 5 | Parameter | |
| MES_PM_ID | 12 | MES ID number of referenced maintenance request | fetches from WorkplaceMaintenanceStatusCommand |
| MAINTENANCE_START_DATE | 10 | Maintenance start date (format: dd.MM.yyyy) | fetches from WorkplaceMaintenanceStatusCommand |
| MAINTENANCE_START_TIME | 6 | Maintenance start time (format: HHMMSS) | fetches from WorkplaceMaintenanceStatusCommand |

Finish Maintenance

Table 8: IDocs for FinishMaintenance /FFMES/CHGPM

| Name in ERPUUpload.xml | Length | Meaning | Source in Infor Forcam MES |
|-----------------------------|--------|---|--|
| SART | 5 | Parameter | |
| MES_PM_ID | 12 | MES id number of referenced maintenance request | fetches from WorkplaceMaintenanceStatusCommand |
| MALFUNCTION_END_DATE | 10 | Malfunction end date (format: dd.MM.yyyy) | fetches from WorkplaceMaintenanceStatusCommand |
| MALFUNCTION_END_TIME | 6 | Malfunction end time (format: HHMMSS) | fetches from WorkplaceMaintenanceStatusCommand |

Appendix A

History of Changes

Table 9: List changes to the document

| Date | Type | Description | Section |
|------------|---------|---------------------------|---------|
| 2020-10-20 | Created | Created from Version 5.10 | |
| | | | |
| | | | |

Terms and Abbreviations

Table 10: Abbreviations used

| Abbreviation | Description |
|--------------|---|
| APL (WPL) | Workplace |
| ID | Identifier (unique, system-internal name) |
| IDoc | Intermediate Document (SAP document format) |
| M | Maintenance |













| | |
|------------|--|
| MES | Manufacturing Execution System |
| R | Repair |
| R1 | Operating state of the first level of detail |
| SFT | Shop floor terminal |





Table 11: Terms used


| Abbreviation | Description |
|------------------|--|
| Button | Button in the shop floor terminal |
| Split | Split of an operation |
| Workbench | Multilingual, web based application for the configuration of master data and other terminal-specific adjustments. The workbench is used to configure Infor Forcam MES. |

Icons

Table 12: Icons used

| Icon | Function | Icon | Function |
|---|------------------------------|---|------------------------------|
|  | Move function one level up |  | Move function one level down |
|  | Navigate one level up |  | Navigate one level down |
|  | Navigate to the left |  | Navigate to the right |
|  | Move everything to the left |  | Move to the left |
|  | Move everything to the right |  | Move to the right |
|  | Open selection window |  | Edit entry |

| Icon | Function | Icon | Function |
|---|------------------------------------|---|-----------------------------|
|  | Add |  | Remove |
|  | Create new file |  | Open help menu |
|  | Set search area |  | Release set search area |
|  | Navigate junction higher |  | Navigate junction lower |
|  | Restore original navigator symbols |  | Update/ reload |
|  | Export |  | Import |
|  | Show XML code |  | Open drop-down menu |
|  | Select line |  | Name/ description (literal) |
|  | Copy link of the selected terminal |  | Minimize/ Maximize |
|  | Change size |  | Export in PDF format |
|  | Export in CSV format |  | Change configuration |
|  | Search |  | Reset search filter |
|  | Apply changes |  | Reject changes |
|  | Activity step dialog |  | Activity step command |

| Icon | Function | Icon | Function |
|---|---------------|------|----------|
|  | Close content | | |

Convention and Navigation

Table 13: Document Conventions





| Conventions | Description |
|-------------------------------|---|
| Boldface | The label of buttons and title of tables and fields are printed in boldface. |
| Icons | If a function is displayed as an icon, the icon is referred to as an object. |
| Path | Each specified path relates to the navigator in the workbench. |
| Action step | Action steps are marked as numbers at the beginning of the sentence. The order of numbers corresponds to the order of the actions. Alternative action steps are separated by Or . |
| Action prerequisite | Action prerequisites are marked by  . |
| Action result | Action results are marked by  . |
| Notice | Notices are marked by  . |
| Sub-steps of an action | Sub-steps of an action are indented and have uniform symbols per action level. The order of the levels is: 1. a. i. |

Table 14: Navigation in the workbench

| Navigation | Description |
|-----------------------|---|
| Close con | Each content called-up in the navigator can be closed via  at the right-hand edge of the screen. |
| Breadcrumb bar | If sub-pages or continuative displays respectively, a breadcrumb bar appears at the upper edge of the screen. A click on the first element closes all sub-pages. |
| Direct editing | Most of the cells in displayed tables can be edited either directly or via the context menu (right click or drop-down menu). |

| | |
|------------------------|---|
| Blocked columns | Columns with a gray background (display fields) cannot be edited. |
| Update | Since the workbench is web based, updating via the browser (refresh) leads to a log out in the workbench. |
| Error message | Error messages appear at the lower left-hand edge of the screen. |

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