



# Functional Release Notes

Version 5.12.21

## *Release Information*



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## Overview

FORCAM provides companies with all the information they need to control and optimize their production. The modular IIoT solution FORCAM FORCE MES FLEX is as flexible as the needs of customers. With a variety of production apps, FORCAM helps companies to make their processes more transparent and improve their workflows. In this way, companies create the basis for optimization measures and sustainable success, thereby ensuring their competitiveness.

FORCAM is always endeavored to optimize the solution FORCAM FORCE MES FLEX further, to enrich it with functions, offering customers consistent growth and greatest possible use. For this purpose, several releases are published throughout the year.

This document lists functions that have been added or changed during the **5.12.21** release. It serves as an overview of the most important features to use FORCAM FORCE MES FLEX in the best possible way.

Detailed descriptions of the individual functions can be found in the respective product documentation.



## Common

### Support import of .pfx files for certificate

Affected module	Affected area	Status
FFSetup	Import of HTTPs Certificates	Changed

HTTPs certificates are frequently provided in a .pfx format. These certificates are then manually imported into ffsetup after converting them to .jks format. However, this conversion process is deemed unnecessary and manual. Now, ffsetup is enhanced by allowing the direct import of .pfx certificates and implementing internal automatic conversion to both .jks and .crt formats for Nginx.

## Workflow Control

Workplace list in SFT is collapsed by default

Affected module	Affected area	Status
Workbench/SFT	Configuration	Changed

**Path:** Workbench > Configuration > Shop Floor Terminal


In **SFT**, the Workplace list is primarily unused because the majority of terminals have only one workplace assigned. As a result, the default behavior has been modified to collapse the workplace list by default.

When adding a new Operation View to a template the default value of **Open workplace list initially** is false.

Template Editor (Use Case 2: Data Collection Acquisition with Production Orders/Operations)		
List of Base Pages	Identifier	Value
<ul style="list-style-type: none"> <li>Use Case 2: Data Collection Acquisition with <ul style="list-style-type: none"> <li>Status History (Operating State History)</li> <li>Operation View (Operation View) - Root E</li> <li>Reports (Browser)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Operation View <ul style="list-style-type: none"> <li>Name</li> <li>Description</li> <li>Height Upper Table</li> <li>Width of the workplace</li> <li>Width of the Operation List</li> <li>Automatic update cycle for complete basepage [MS]</li> <li>Automatic Update Cycle for Detail View [sec]</li> <li>Open workplace list initially</li> <li>Operations list sorting ascending order - Keep empty values at bottom</li> <li>Barcode Scan Configuration</li> <li>Search operations on all terminal workplaces</li> <li>Terminal identification</li> <li>NC/DNC Configuration</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Operation View</li> <li>Operations Page</li> <li>50%</li> <li>39%</li> <li>155%</li> <li>30</li> <li>60</li> <li><input type="checkbox"/></li> <li><input type="checkbox"/></li> <li>0%</li> <li><input type="checkbox"/></li> <li></li> <li></li> </ul>
Base page configuration		
<ul style="list-style-type: none"> <li>Operation View (Operation View) - Root Base <ul style="list-style-type: none"> <li>Button Bar</li> <li>Workplace table</li> <li>Operation Table</li> <li>Operation Details</li> </ul> </li> </ul>		

### Use Case Templates

In all of the use case templates, the configuration of **Open workplace list initially** is set to false.

 No behavior changes on existing templates. If changes are required, it can be made manually.

## Expandable & collapsible operation detail view in SFT

Affected module	Affected area	Status
SFT	Operation Detail View	Changed

In the Shop Floor Terminal, the usable area for the Operation Detail View is maximized by extending the order area (Workplace & Operation grids) to allow for minimization.

**Path:** Workbench > Shopfloor Terminal Configurator > Basepage Operation View UI

As shown below, new configuration for base page Operation View UI is introduced to expand/collapse the order area (Workplace & Operation grid area):

- **Operation View > Full screen mode for detail view:** Boolean configuration to decide if the order area (Workplace & Operation grid area) is expanded or collapsed initially after user has logged in. Default is false.

If the configuration, **Full screen mode for detail view** is set to false, means that the order area is expanded and Operation Detail area will have relatively less space.

If the configuration, **Full screen mode for detail view** is set to true, means that the order area is collapsed and Operation Detail area will have relatively large space.

Identifier	Value
Operation View	
Name	Operation View
Description	Operations Page
Height Upper Table	50%
Width of the workplace	39%
Width of the Operation List	155%
Automatic update cycle for complete basepage [MS]	900
Automatic Update Cycle for Detail View [sec]	60
Open workplace list initially	<input type="checkbox"/>
Operations list sorting ascending order - Keep empty values at bottom	<input type="checkbox"/>
Full screen mode for detail view	<input type="checkbox"/>
Barcode Scan Configuration	0%
Search operations on all terminal workplaces	<input type="checkbox"/>
Terminal identification	
NC/DNC Configuration	

### FFWorker

#### Operation View UI

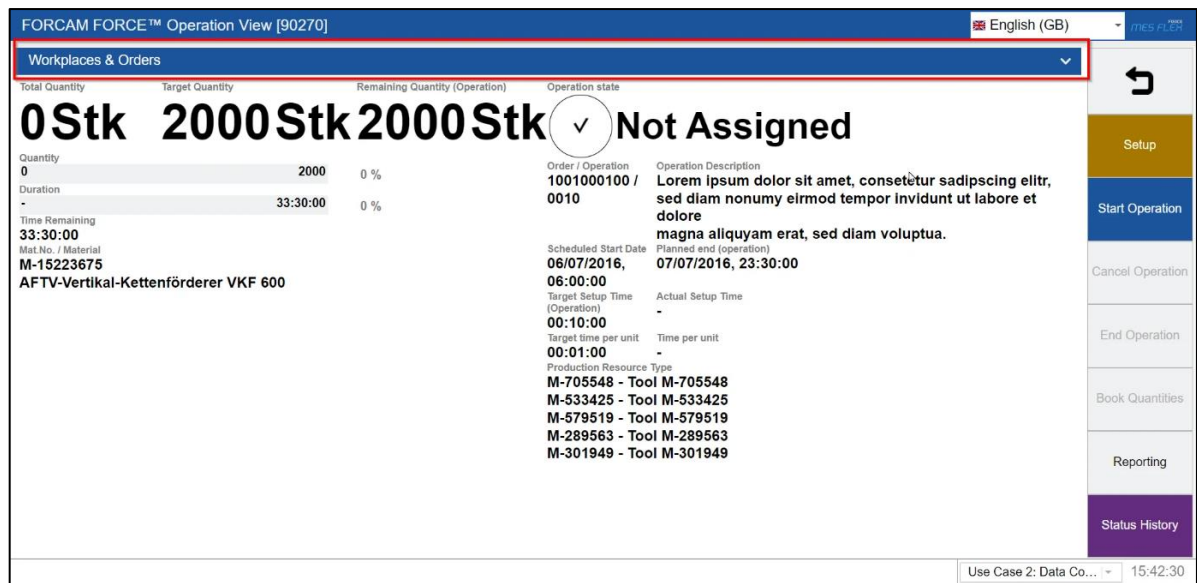
Base page Operation View is extended to handle the possibility of providing maximized space to be used for Operation Detail area.

Below are the extensions done for the base page:

- A header above the order area is introduced to enable the user to maximize (or restore) the Operation Detail area dynamically.

- A new JavaScript variable **DPV\_fullScreenMode** is introduced providing the information (to be used in the HTML structure) regarding the current mode of the Operation Detail area. This JavaScript variable can be used to design a responsive Operation Detail area depending upon the customer use case:
  - If the current mode of the Operation Detail area is maximized then the value contained by the JavaScript variable **DPV\_fullScreenMode** is true.
  - If the current mode of the Operation Detail area is not maximized (Regular or Restored view) then the value contained by the JavaScript variable **DPV\_fullScreenMode** is false.

#### Maximized Operation Detail area:



FORCAM FORCE™ Operation View [90270] English (GB)

Workplaces & Orders

Total Quantity: 0 Stk Target Quantity: 2000 Stk Remaining Quantity (Operation): 2000 Stk Operation state: Not Assigned

Quantity: 0 Duration: 33:30:00 Time Remaining: 33:30:00 Mat.No. / Material: M-15223675 AFTV-Vertikal-Kettenförderer VKF 600

Order / Operation: 1001000100 / 0010 Operation Description: Lorem ipsum dolor sit amet, consetetur sadipscing elitr, sed diam nonumy eirmod tempor invidunt ut labore et dolore magna aliquyam erat, sed diam voluptua.

Scheduled Start Date: 06/07/2016, 06:00:00 Planned end (operation): 07/07/2016, 23:30:00

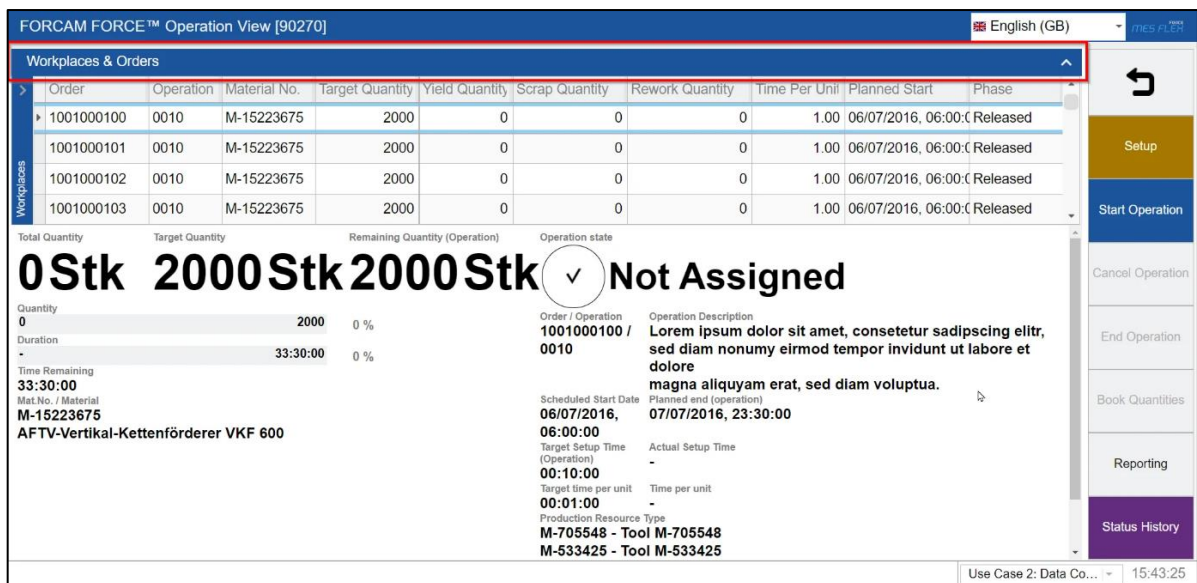
Target Setup Time (Operation): 00:10:00 Actual Setup Time: -

Target time per unit: 00:01:00 Time per unit: -

Production Resource Type: M-705548 - Tool M-705548 M-533425 - Tool M-533425 M-579519 - Tool M-579519 M-289563 - Tool M-289563 M-301949 - Tool M-301949

Use Case 2: Data Co... 15:42:30

#### Restored Operation Detail area:



FORCAM FORCE™ Operation View [90270] English (GB)

Workplaces & Orders

Order	Operation	Material No.	Target Quantity	Yield Quantity	Scrap Quantity	Rework Quantity	Time Per Unit	Planned Start	Phase
1001000100	0010	M-15223675	2000	0	0	0	1.00	06/07/2016, 06:00:00	Released
1001000101	0010	M-15223675	2000	0	0	0	1.00	06/07/2016, 06:00:00	Released
1001000102	0010	M-15223675	2000	0	0	0	1.00	06/07/2016, 06:00:00	Released
1001000103	0010	M-15223675	2000	0	0	0	1.00	06/07/2016, 06:00:00	Released

Total Quantity: 0 Stk Target Quantity: 2000 Stk Remaining Quantity (Operation): 2000 Stk Operation state: Not Assigned

Quantity: 0 Duration: 33:30:00 Time Remaining: 33:30:00 Mat.No. / Material: M-15223675 AFTV-Vertikal-Kettenförderer VKF 600

Order / Operation: 1001000100 / 0010 Operation Description: Lorem ipsum dolor sit amet, consetetur sadipscing elitr, sed diam nonumy eirmod tempor invidunt ut labore et dolore magna aliquyam erat, sed diam voluptua.

Scheduled Start Date: 06/07/2016, 06:00:00 Planned end (operation): 07/07/2016, 23:30:00

Target Setup Time (Operation): 00:10:00 Actual Setup Time: -

Target time per unit: 00:01:00 Time per unit: -

Production Resource Type: M-705548 - Tool M-705548 M-533425 - Tool M-533425

Use Case 2: Data Co... 15:43:25



The JavaScript variable `DPV_fullScreenMode`:

```
<script type="text/javascript" src="/lib/js/jquery/jquery.js" ></script>
<style type="text/css">
body {overflow:auto;}
td {font-family: arial; font-weight: bold; color: grey; font-size: 100%; line-height: 1.2em; margin: 0; }
#H1 {font-family: arial; font-weight: bold; color: grey; font-size: 80%; line-height: 1.2em; width: 100%; margin: 0; }
#V1 {font-family: arial; font-weight: bold; color: black; font-size: 400%; line-height: 1.2em; width: 120%; margin: 0; }
#V3 {font-family: arial; font-weight: bold; color: black; font-size: 300%; line-height: 1.2em; width: 120%; margin: 0; }
#V2 {font-family: arial; font-weight: bold; color: black; font-size: 120%; line-height: 1.2em; width: 120%; margin: 0; }
table td, table td * {
    vertical-align: top;
}
</style>
</head>
<!-- insert variable definitions BEGIN -->
<script type="text/javascript">
var DPV_contextPath = "/ffworker";
var DPV_authStringAuthToken = "C...rVQtPlyJd12KPapwgmxePLfIoQGrPklohdepFslRjQpZDKhPBWttvz0MosD5Eh0A5CUQ8j_AwB85HL3JXhZ1S7C0s";
var DPV_fullScreenMode = "false";
var DPV_hostAddress = "192.168.179.34";
var DPV_hostName = "AmitNB";
var DPV_locale = "en_GB";
var DPV_requestURL = "https://amitnb:11443/ffworker/reportserver;jsessionid=DD47E8129E2CA468FB95B633FABCE324";
var DPV_scaleFactor = "100.0";
var DPV_serverName = "amitnb";
var DPV_serverPort = 11443;
var DPV_serverProtocol = "https://";
var DPV_servletPath = "/reportserver";
var DPV_timezone = "Europe/Berlin";
var DPV_timezoneRawOffset = 3600000;
var DPV_timezoneUseDST = Boolean(true);
var DPV_timezoneInDST = Boolean(true);
var DPV_useThousandSeparator = Boolean(false);
var DP_WORKPLACE = new Array();
DP_WORKPLACE[0] = new Object();
DP_WORKPLACE[0].derivedColor = "#B6BABF";
DP_WORKPLACE[0].derivedColor$blackorwhite = "#000000";

var DP_OPERATION = new Array();
DP_OPERATION[0] = new Object();
DP_OPERATION[0].bookedReworkQuantity = "0";
DP_OPERATION[0].bookedReworkQuantity$noOfDecimalPlaces = 0;
DP_OPERATION[0].bookedReworkQuantity$unit = "Stk";
DP_OPERATION[0].bookedReworkQuantity$value = 0.0;
DP_OPERATION[0].bookedReworkQuantity$valuePreformatted = "0";
DP_OPERATION[0].bookedReworkQuantity$valueRounded = 0.0;
DP_OPERATION[0].bookedScrapQuantity = "0";
DP_OPERATION[0].bookedScrapQuantity$noOfDecimalPlaces = 0;
DP_OPERATION[0].bookedScrapQuantity$unit = "Stk";
DP_OPERATION[0].bookedScrapQuantity$value = 0.0;
```



## Planning

### FFScheduling extension: Fixing started operations to a workplace

Affected module	Affected area	Status
FFScheduling	Master Data	New

**Path:** FFScheduling client > Master Data

When configured, interrupted operations will be treated as if they were fixed to the workplace on which they ran before. All orders have to be refreshed after the update. The configuration is in the system master data.

- **English:** Fix interrupted operations on workplace
- **German:** Unterbrochene AVOs auf Arbeitsplatz fixieren
- **French:** Fixer opérations interrompues sur poste de travail

The screenshot shows the 'Editor' window for 'Master Data'. The window contains a table with two columns: 'Name' and 'Value'. The table lists various configuration options. The option 'Fix interrupted operations on workplace' is highlighted with a red rectangle, and its value is checked. Other options include 'Default Font Size' (11), 'Site Restriction', 'Operation Control Keys', 'Alternative Operation Control Keys', 'Unattended Operation Control Key', 'Planning Base' (Workplace), 'All workplaces of the group are alternative' (checked), 'Workplace Alternatives' (Add), 'Plan Order Field', 'Order Comment Field', 'Target Setup Time Field', 'Default Transport Amount', 'Transport amount refers to production sta' (checked), and 'Queue Time Options'.

Name	Value
Default Font Size	11
Site Restriction	
Operation Control Keys	
Alternative Operation Control Keys	
Unattended Operation Control Key	
Planning Base	Workplace
All workplaces of the group are alternative	<input checked="" type="checkbox"/>
Workplace Alternatives	Add
Fix interrupted operations on workplace	<input checked="" type="checkbox"/>
Plan Order Field	
Order Comment Field	
Target Setup Time Field	
Default Transport Amount	
Transport amount refers to production sta	<input checked="" type="checkbox"/>
Queue Time Options	

Editor

Systemdaten

Name	Wert
Default-Schriftgröße	11
Einschränkung auf Werk	
Steuerschlüssel der AVO's	
Steuerschlüssel der Alternativ-AVO's	
Steuerschlüssel für bedienerlose AVO	
Planungsgrundlage	Arbeitsplatz
Alle Arbeitsplätze der Gruppe sind Alternativen	<input checked="" type="checkbox"/>
Alternativ-Arbeitsplätze	Hinzufügen
Unterbrochene AVOs auf Arbeitsplatz fixieren	<input checked="" type="checkbox"/>
Auftrags-Kommentarfeld	
Sollrüstzeit-Feld	
Standard Weitergabemenge	
Weitergabemenge bezieht sich auf Produktion	<input checked="" type="checkbox"/>
Transportzeit Optionen	

Editeur

Données du système

Nom	Valeur
Taille de police par défaut	11
Restriction à la division	
Clé de commande des opérations	
Clé de commande des opérations alternatives	
Clé de commande des opérations sans surveillance	
Base de planification	Poste de travail
Tous les postes de travail du groupe sont des alternatives	<input checked="" type="checkbox"/>
Postes de travail alternatifs	Ajouter
Fixer opérations interrompues sur poste de travail	<input checked="" type="checkbox"/>
Champ des ordres planifiés	
Champ des commentaires de l'ordre	
Champ du temps de préparation théorique	
Quantité de transfert standard	
La quantité de transfert se réfère au début de production	<input checked="" type="checkbox"/>
Options de temps de transport	

## Improved access of availability in Digital Planning Board

Affected module	Affected area	Status
Workbench	Digital Planning Board	Changed

In the ORG Hierarchy, the attribute workplace availability factor now uses percentage values (e.g., 80) instead of factor values (e.g., 0.8)

Attributes: 90270 - B07

#	Attribute Name	Description	Value	Inherited	Overwriter	Will Be Inh	Read-Only
1	Language	Language	de-DE	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	Time zone	Time zone	(+02:00) Europe/Berlin - Central Eu	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	ERP Key	ERP Key	100-9000-9000	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	Personnel ERP Key	Personnel ERP I	Selected (1), Available (0)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	Overhead Cost ERP Key	Overhead Cost		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	Cost Center	Cost Center		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	Operation Overlap	Operation Over		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8	Availability	are permissible.	200	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Availability of the workplace as percentage value. Values > 0 and comma values are permissible.

OK Cancel

### Removal of Consider availability (workplace) from Digital Planning Board

In the Digital Planning Board's configuration under Planning Mode, the option **Consider availability (Workplace)** has been removed. Consequently, when a user has defined availability in the ORG Hierarchy, that value is now directly considered for recalculation.

Edit Configuration

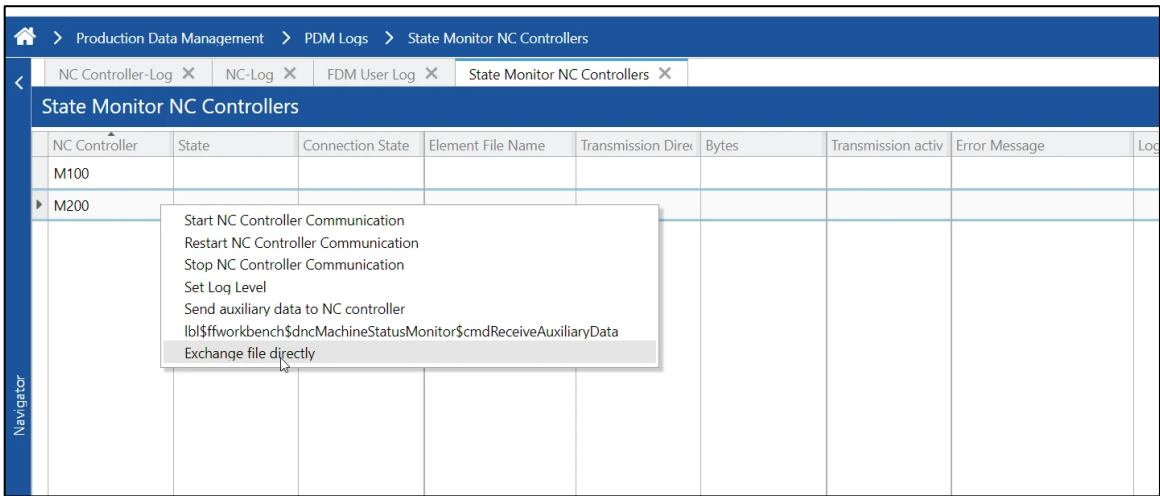
Identifier	Value
Planning Mode	
Monitoring Mode	
Columns Operation Table	
Gantt chart	
Bar Text Gantt Chart	
Workplace Tooltip Gantt Chart	
Operation Tooltip Gantt Chart	
Color Models	
Columns Capacity View	
Search fields	
General	
Restricted Operation Areas	Selected (0), Available (3)
Operation elongation areas	Selected (3), Available (0)
Quantities for Remaining Time Calculation	Selected (2), Available (2)
Close Gap Automatically	<input type="checkbox"/>
Display Overlap Status	<input checked="" type="checkbox"/>
Check group capacity	<input type="checkbox"/>
Check operation sequence	<input checked="" type="checkbox"/>
Consider individual production time per unit	<input checked="" type="checkbox"/>
Consider availability (workplace)	<input checked="" type="checkbox"/>

## Platform & Connectivity

### NC-File Transfer between machines

Affected module	Affected area	Status
Workbench	Production Data Management	New

In the context menu of the source NC Controller is now possible to select **Exchange file directly**.



The user is provided with the option to select the target NC Controller. Additionally, if the NC Controller does not utilize files, the user is required to input a filename.

### Exchange file directly

Source NC controller

M200

File Name (With File Extension)

filename.nc

Target NC controller

M100

OK

Cancel

To initiate the exchange, the user is required to commence the receiving process on the destination NC Controller. Subsequently, the sending process on the source NC Controller must be initiated.

## Request program handling

Affected module	Affected area	Status
PDM/DNC	PDM/DNC	New

The new variant of **Simple Request File Handler** is introduced in the PDM for Request program handling. With the help of this variant even with minimum configuration, it is possible to request the NC file from machine.

With **Simple Request File Handler** Request program handling:

- Only the program number (which is stored as packet key 2) is provided resp. necessary as single line in the request file.
- There is no file upload with this handler, i.e., communication machine → PDM. Thus, there is no type of entry (defining NCP, OPT etc.).
- The system lacks an element version number feature. Instead, it consistently provides the highest available element version when multiple versions exist.
- Only elements of the configured “Transferable Element Sources” (example:FDM and EXT) are provided. Additionally, to the “Standard” variant, transferable element NC-Types can be configured.

As an example, see the following request file, specifying packet number “81759”:

```
1  %#R81759
```

The packet number gets parsed via RegEx as usual, according to the given configuration.

### Workbench

An additional configuration variant called **Simple Request File Handler** is available. It is shown in the example below:

- Configuration to read the packet number (represented with program number) from line 1 in a request file, as packet\_key2) variable.
- NC types, only for variant **Simple Request File Handler**, a new attribute is introduced. It helps to identify the correct NC file to transfer to machine.

## Mitsubishi MDC and DNC plugin

Affected module	Affected area	Status
FORCE MES FLEX	FORCE MES FLEX	New

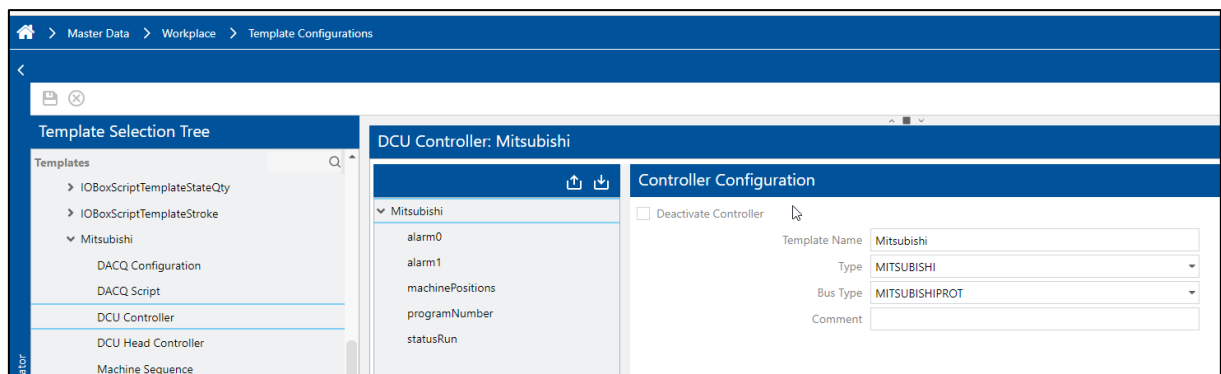
A new MDC and DNC plugin to connect Mitsubishi controllers is created.

### DCU controller configuration

**Path:** Workbench > Master Data > Workplace > Template Configuration / Workbench > Master Data > Workplace > Workplace Configuration

### Configuration parameters:

Parameter	Description
Address:Port (Service)	Address and port used for connecting from the DCU to the MitsubishiService
Address:Port (Machine)	Address and port used for connecting from the MitsubishiService to the machine
Connection ID / Host name / NC Control Unit number	Parameters for the connection to the machine
NC system type	Type of the Mitsubishi machine
Connection timeout in ms (Service / CNC)	Timeout on connection to the MitsubishiService / to the machine.



Home > Master Data > Workplace > Workplace Configuration > Controller Configuration

Controller Configuration

☐ Deactivate Controller

DCU: DCU1

Controller: Mitsubishi100

Name: Mitsubishi

Type: MITSUBISHI

Bus Type: MITSUBISHIPROT

Address:Port (Service): localhost:61683

Address:Port (Machine): 127.0.0.1:683

Connection ID / Host name / NC Control U...: localhost/localhost/1

NC system type:

Connection timeout in ms (Service / CNC): 25000/25000

Comment:

Navigator: Mitsubishi100, alarm0, alarm1, machinePositions, programNumber, statusRun

### DNC configuration

**Path:** Workbench > Production Data Management > PDM Configurations > DNC Machine Configuration > Plug-in for NC Controller Communication

### Configuration parameters:

Parameter	Description
<b>Connection ID</b>	Connection ID (parameter of the machine connection)
<b>Address (Service)</b>	Address of the MitsubishiService program
<b>Port (Service)</b>	Port of the MitsubishiService program
<b>NC system type</b>	Type of the Mitsubishi machine: 5 EZNC_SYS_MELDAS700L 6 EZNC_SYS_MELDAS700M 7 EZNC_SYS_MELDASC70 8 EZNC_SYS_MELDAS800L 9 EZNC_SYS_MELDAS800M 10 EZNC_SYS_CNCC80
<b>NC Control Unit Number</b>	Control Unit Number (parameter of the machine connection)
<b>Connection timeout in ms (Service / CNC)</b>	Timeout on connection to the machine
<b>Host name</b>	Host name (parameter of the machine connection)
<b>Log level</b>	Log level of the MitsubishiService (FATAL, CRITICAL, ERROR, WARNING, INFO, DEBUG)
<b>Machine directory</b>	DNC program directory on the machine



Production Data Management > PDM Configurations > DNC Machine Configuration

DNC Machine Configuration

NC Controller Selection: M100

Identifier	Value
▼ Mitsubishi	
Connection ID	localhost
Address (Service)	localhost
Port (Service)	61,683
Address (Machine)	127.0.0.1
Port (Machine)	683
NC system type	6
NC Control Unit Number	1
Connection timeout in ms (CNC)	25,000
Host name	EZNC_LOCALHOST
Log level	INFO
Machine directory	M01:\PRG\USER\

## Short Term Process Data in SQL DB

Affected module	Affected area	Status
<b>FFWebservices/SFT/FFWorkbench/FFSetup</b>	FFWebservices/SFT/FFWorkbench/FFSetup	New/Changed

Until now, MES FLEX exclusively supported Mongo DB for energy data management, catering to smaller customers or those with limited energy data requirements. However, a significant enhancement has been introduced, enabling the processing and evaluation of measured values within SQL Server or Oracle DB environments.

This upgrade enables triggering process data via APIs, facilitating its utilization in the Worker-Client interface for various purposes such as Operation detail view, enabling/disabling button, etc. Furthermore, users can create custom reports and visualizations to closely monitor the data.

### Process Data Lifecycle

- Measured values are stored both in table for current values and table for historical data.
- Current value of measurement will be overwritten with next value (but is still present in the historical data).
- History of the values of a measured value is only kept for a certain configurable period of time.
- History data can also be transferred to a separate archive database (not part of the standard solution but a project specific extra solution)

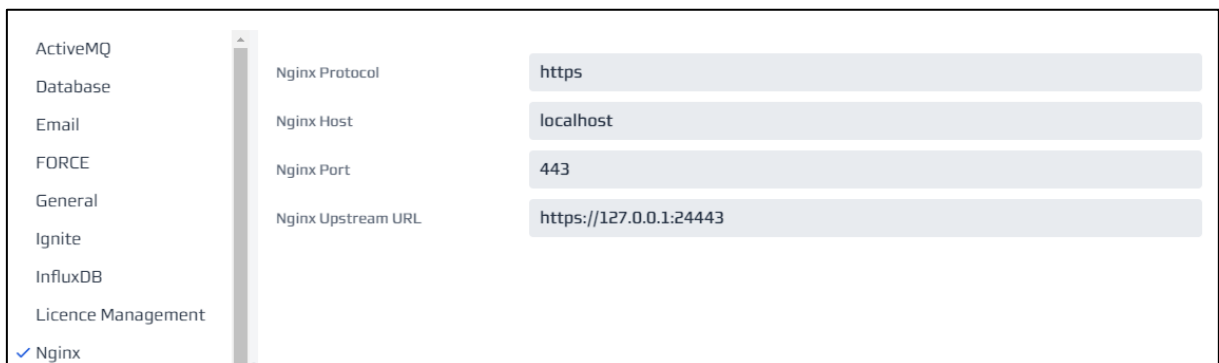
### Nginx (New Application)

Nginx is a new application in the Force-MES. Nginx acts as a middleman between two servers (SFT and Webservice, presently). It functions as a cache and reverse proxy, meaning it stores frequently accessed data and forwards requests to the appropriate server, improving performance and efficiency.

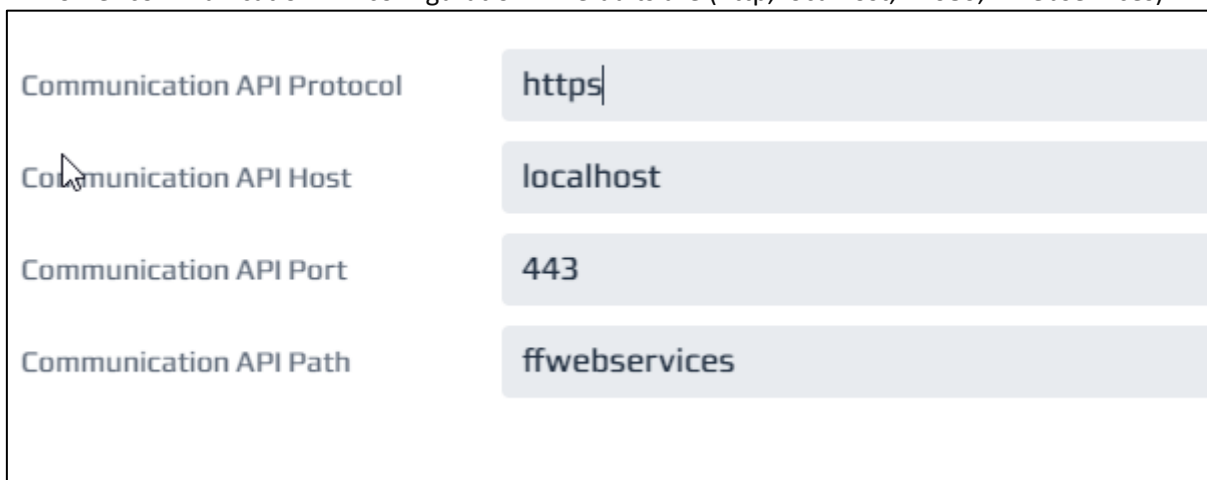
Nginx is used as a cache and reverse-proxy server in the force MES that's currently sits/placed between the SFT and Webservices. It's main task is to cache the response of the request and return the response back in case of same request is received again as well as it also has hidden the Webservices URL and details.

### Nginx installation

Nginx as an optional installable application is available via ffsetup. One can select the application in the ffsetup applications and install it by providing the necessary configurations like protocol, port and backend server url. It is recommended to use the https and secure port 443 which are also defaults. The webservice URL also to be configured accordingly, the default is local webservices URL. SFT communication URL shall also be changed to the Nginx host and port.



FFWorker communication API configuration :- Defaults are (http, localhost, 24080, ffwebservices)



### FFWebservices

#### Command and Callback API – Short Term Process Data

A new API has been introduced to receive Short Term Process Data. It can be found under the "Command API" "Short Term Process Data" section.

**Short Term Process Data** ^

POST /shortTermProcessRecords Add process data v

JSON example:

```
{
  "timestamp": "2023-05-17T14:20:39.085Z",
  "measurement": "temperature",
  "measuredValue": 1.0,
  "measurementSource": "MACHINE_1",
  "domain": "GENERIC",
  "additionalText": "more information"
}
```

The domain can be set as one of the following:

- GENERIC
- WORKPLACE
- OPERATION

If the domain is WORKPLACE or OPERATION, the measurementSource has to be the UUID of the Workplace or the Operation.

### Shopfloor Terminal

#### Dark activity step - Query current process value

A new dark activity step has been introduced to query one or multiple **short-term current process data** measurements. Each requested measurement is identified by its name and source (its key).

There are two ways how desired measurements can be defined, either one or both together can be used to:

- define measurements explicit, i.e., with its keys.
- domain object related measurements (Workplace, Operation), i.e., for given domain objects appropriate measurement-names could be given.

Identifier

Q

Value

▼ Query current process values

Activity step name

Qry process dat

> Configuration of Execution Conditions

When cancelling continue reporting procedure

☑

▼ inputparameters

(2) List Elements

Parameter Assignment

Parameter (EVERY)

→ Current process value names to query (EVERY)

Parameter Assignment

Workplace (WPL)

→ Current process value sources to query (EVERY)

▼ Output parameters

(1) List Elements

Parameter Assignment

Parameter 10 (EVERY)

← Current process values (EVERY)

Current process value names to query

[domain\_nameCfg1, domain\_nameCfg2, domain\_nameCfg3]

Add Activity Step (Behind)

[1 / 159] Clear filter Suspend Filter Filter Row

Identifier	Name	Description
Q querycurrent	Q	Q
QueryCurrentProcessDataMeasurementsActivityStep	Query current process values	t short-term process values (with or without domain object reference). Query one or more current short-term process values (with or without domain object reference).

Contained Literals:

Identifier	Value
Activity step name	Q

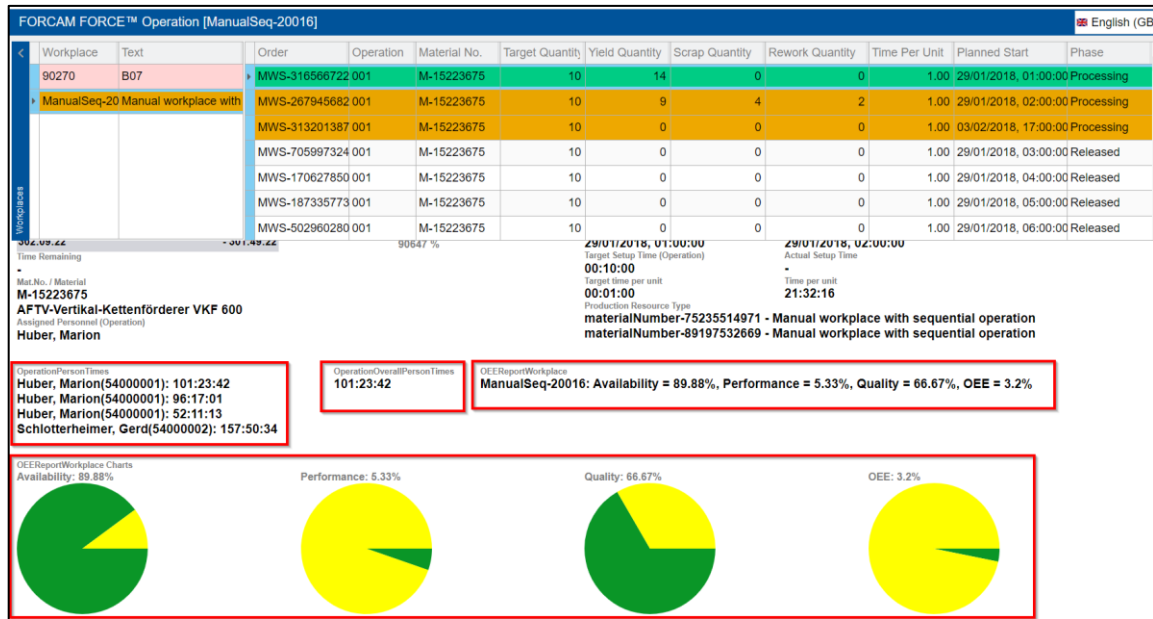
OK Cancel

Figure: Steps configuration within SFT > Template Editor:

Enhanced Operation Detail View

Path: SFT > Operation View basepage > Operation Detail View

The generation of Operation Detail view is now extended to support the display of data received for the configured standard reports (report configuration can be done in Workbench > Template Editor). The configured report is called via BridgeAPI and the response is made available to Operation Details HTML. This data can be used to display in plain string format or can be displayed in formatted tabular or any other visual data format like graphs, charts etc. as shown below:



Below the sample JS variables to be used for displaying report data is shown:

```

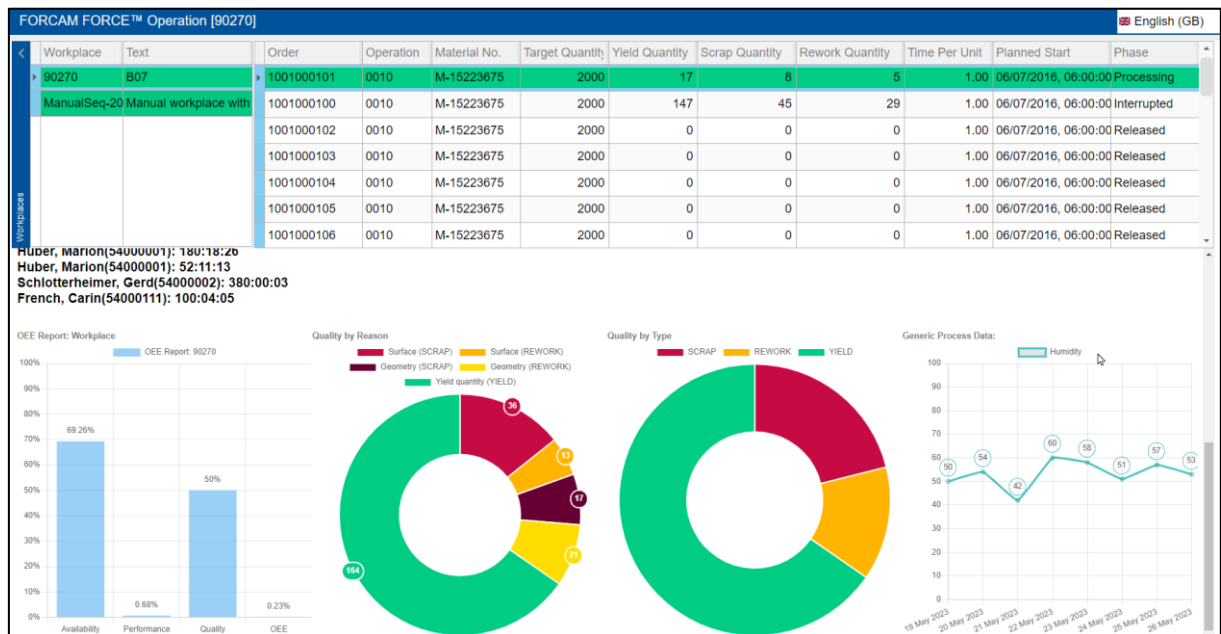
162 DP_OPERATION_STATUS[0].description = "Production";
163 var Report_OperationPersonTimes = new Array();
164 Report_OperationPersonTimes[0] = new Object();
165 Report_OperationPersonTimes[0].reportName = "OperationPersonTimes";
166 Report_OperationPersonTimes[0].SqlResultRow = new Array();
167 Report_OperationPersonTimes[0].SqlResultRow[0] = new Object();
168 Report_OperationPersonTimes[0].SqlResultRow[0].firstName = "Marion";
169 Report_OperationPersonTimes[0].SqlResultRow[0].lastName = "Huber";
170 Report_OperationPersonTimes[0].SqlResultRow[0].personTime = "101:24:47";
171 Report_OperationPersonTimes[0].SqlResultRow[0].personnelNumber = "54000001";
172 Report_OperationPersonTimes[0].SqlResultRow[1] = new Object();
173 Report_OperationPersonTimes[0].SqlResultRow[1].firstName = "Marion";
174 Report_OperationPersonTimes[0].SqlResultRow[1].lastName = "Huber";
175 Report_OperationPersonTimes[0].SqlResultRow[1].personTime = "96:18:05";
176 Report_OperationPersonTimes[0].SqlResultRow[1].personnelNumber = "54000001";
177 Report_OperationPersonTimes[0].SqlResultRow[2] = new Object();
178 Report_OperationPersonTimes[0].SqlResultRow[2].firstName = "Marion";
179 Report_OperationPersonTimes[0].SqlResultRow[2].lastName = "Huber";
180 Report_OperationPersonTimes[0].SqlResultRow[2].personTime = "52:11:13";
181 Report_OperationPersonTimes[0].SqlResultRow[2].personnelNumber = "54000001";
182 Report_OperationPersonTimes[0].SqlResultRow[3] = new Object();
183 Report_OperationPersonTimes[0].SqlResultRow[3].firstName = "Gerd";
184 Report_OperationPersonTimes[0].SqlResultRow[3].lastName = "Schlotterheimer";
185 Report_OperationPersonTimes[0].SqlResultRow[3].personTime = "157:53:48";
186 Report_OperationPersonTimes[0].SqlResultRow[3].personnelNumber = "54000002";
187 var Report_OperationOverallPersonTimes = new Array();
188 Report_OperationOverallPersonTimes[0] = new Object();
189 Report_OperationOverallPersonTimes[0].reportName = "OperationOverallPersonTimes";
190 Report_OperationOverallPersonTimes[0].SqlResultRow = new Array();
191 Report_OperationOverallPersonTimes[0].SqlResultRow[0] = new Object();
192 Report_OperationOverallPersonTimes[0].SqlResultRow[0].personTime = "101:24:47";
193 var Report_OEEReportWorkplace = new Array();
194 Report_OEEReportWorkplace[0] = new Object();
195 Report_OEEReportWorkplace[0].reportName = "OEEReportWorkplace";
196 Report_OEEReportWorkplace[0].SqlResultRow = new Array();
197 Report_OEEReportWorkplace[0].SqlResultRow[0] = new Object();
198 Report_OEEReportWorkplace[0].SqlResultRow[0].availability = "89.88%";
199 Report_OEEReportWorkplace[0].SqlResultRow[0].oee = "3.2%";
200 Report_OEEReportWorkplace[0].SqlResultRow[0].performance = "5.33%";
201 Report_OEEReportWorkplace[0].SqlResultRow[0].quality = "66.67%";
202 Report_OEEReportWorkplace[0].SqlResultRow[0].workplaceId = "ManualSeq-20016";
203 </script>
204 <!-- Insert variable definitions END -->

```

Creating a graphical view of the report data fetched is now possible within Operation Details View. JavaScript library ChartJS (Version 4.3.0) and its plugin Datalabels (Version 2.0.0) has been added to ffworker service as JS resources.

HTML code snippet to add the libraries while implementing the charts:


```
<script type="text/javascript" src="/ffworker/javascripts/chart.umd.4.3.0.min.js"></script>
<script type="text/javascript" src="/ffworker/javascripts/chartjs-plugin-datalabels.2.2.0.min.js"></script>
```



**Figure: Screenshot containing various possible graphical views**

Conditions to enable SFT Template activity:

- Generic domain:  
ActivityEnablerMethods.isCurrentProcessValueInRange("Humidity", "Factory Hall 1", 40, 45)
- Workplace domain:  
ActivityEnablerMethods.isCurrentProcessValueInRange("Pressure", PKEY\_OperationView\_myWorkplaceId[0], 1100, 1200)
- Operation domain:  
ActivityEnablerMethods.isCurrentProcessValueInRange("Pressure", PKEY\_OperationView\_myOperationId[0], 300, 400)

 New methods introduced to manage activity button enabling in SFT.

## DCU/DACQ

New method call is available in the DACQ-Script:

- Name: SENDPROCESSDATA
- Variables: WPL, Name, Domain (GENERIC, WORKPLACE, OPERATION), Source, MeasuredValue (double), Additional Text (String: max 32). The value of "Source" will be ignored for WORKPLACE and OPERATION domain. See here for parameter details.
- Timestamp will be generated when sending

Add new parameters to javis.ini section “messaging”:

- bridgeApiAdress: IP-Adress of the BridgeAPI
- bridgeApiPort: Port of the BridgeAPI
- bridgeApiTimeout: Timeout for calling the BridgeAPI
- bridgeApiAuthUrl: URL to get access token
- bridgeApiClientId: ID of the client to authorize with
- bridgeApiPasswort: Password for the authentication of the client (encrypted)

Result handling:

- Log Success messages on DEBUG level (else, too much logging in case of many machines and frequent data)
- Log Failure messages in ERROR level
  - Case 1: Timeout  
Messages have to be buffered internally and a sending has to be retried after 1 second
  - Case 2: Error Code returned  
Erroneous messages will not be resent

### Script Examples

Send generic data:

```
SENDPROCESSDATA("@|WPL|@", "Measurement @|WPL|@", "GENERIC", "Source @|WPL|@", processValue, "Generic @|WPL|@");
```

Send workplace data:

```
SENDPROCESSDATA("@|WPL|@", "WP Measurement @|WPL|@", "WORKPLACE", "-", processValue, "Workplace @|WPL|@");
```

Send operation data:

```
SENDPROCESSDATA("@|WPL|@", "OP Measurement @|WPL|@", "operation", "-", processValue, "Workplace @|WPL|@");
```

### Workbench

#### Shopfloor Terminal Template Editor

To configure standard report configuration to be displayed within operation detail view, navigate to Operation View basepage > Operation Details > HTML Configuration:

- In the Operation Details > HTML Configuration > Report configurations, add one entry for each URL.
- In Report configurations > Report configuration, provide the configuration Resource & Sub resource from the standard report (from Webservice Editor in FFNewOffice).
- In Report configuration > URL Parameter list, provide the name/value pair if needed for configured standard report. This name/value pair corresponds to a filter created within the data source of the standard report. One URL may have multiple (or even none) name/value pair. For each name/value pair, one URL Parameter list configuration needs to be configured. The name/value pair consists of Name (corresponds to filter name in data source) and Value (a static value or a dynamic value from internal input mapping).



URL Parameter list may contain below type of filters/parameters:

- Static key-value pair
- Dynamic values (Workplace, Operation)
- Time range filter

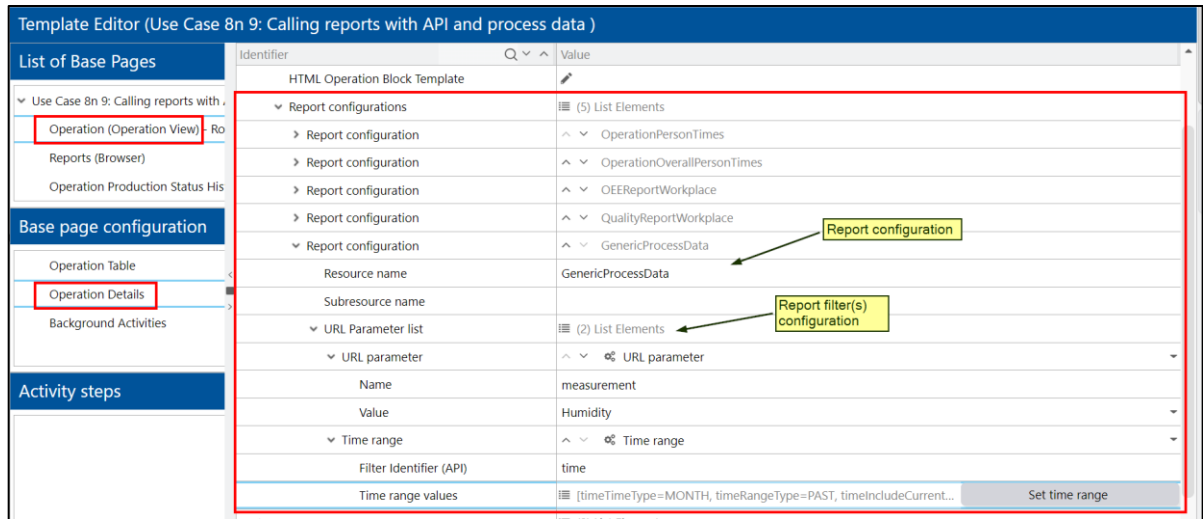


Figure: Operation detail view – Report configuration

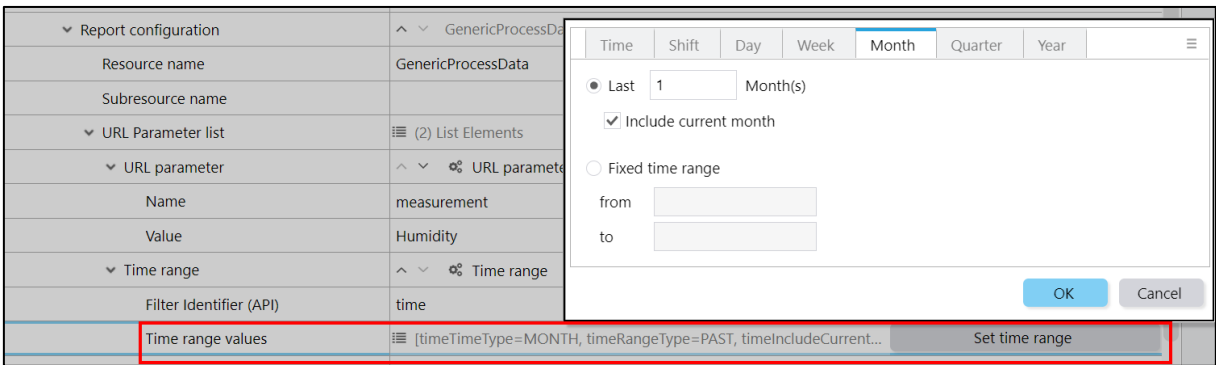
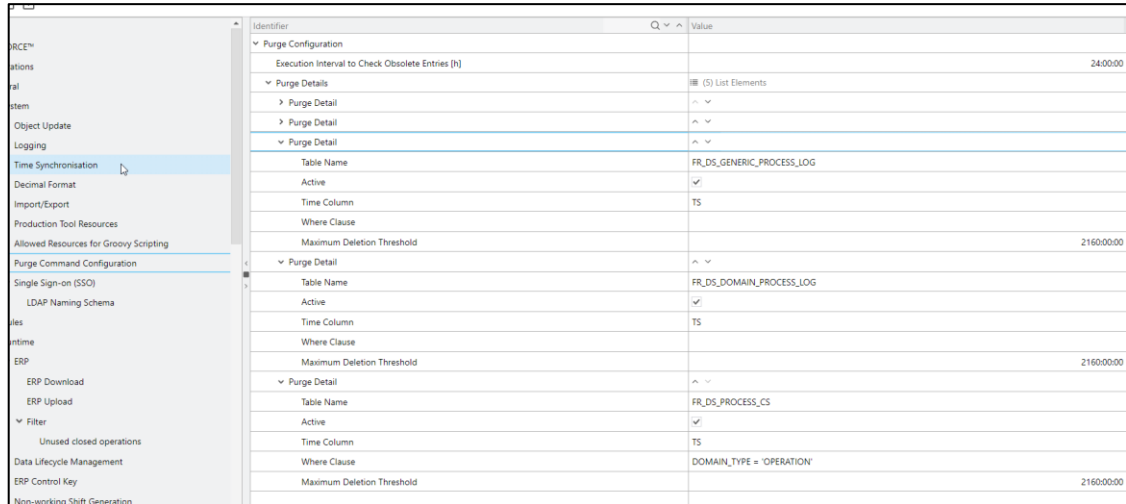


Figure: Report Configuration > Time filter > define time range

### System configuration purge the process data

Workbench system configuration (under Configuration > System > Purge Commands Configuration) has been updated to have 3 additional table entries which can also be configured to purge the data from configured tables.



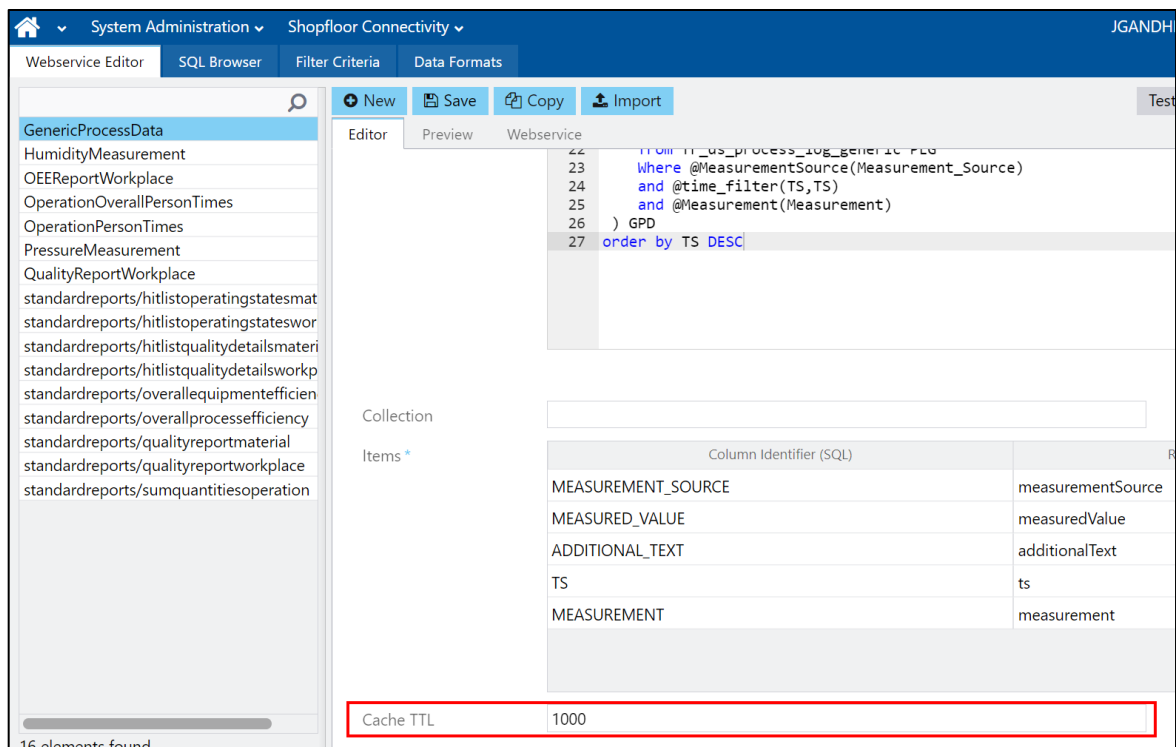
Identifier	Value
Purge Configuration	
Execution Interval to Check Obsolete Entries (h)	24:00:00
Purge Details	(S) List Elements
Purge Detail	
Purge Detail	
Purge Detail	
Table Name	FR_DS_GENERIC_PROCESS_LOG
Active	<input checked="" type="checkbox"/>
Time Column	TS
Where Clause	
Maximum Deletion Threshold	2160:00:00
Purge Detail	
Table Name	FR_DS_DOMAIN_PROCESS_LOG
Active	<input checked="" type="checkbox"/>
Time Column	TS
Where Clause	
Maximum Deletion Threshold	2160:00:00
Purge Detail	
Table Name	FR_DS_PROCESS_CS
Active	<input checked="" type="checkbox"/>
Time Column	TS
Where Clause	DOMAIN_TYPE = 'OPERATION'
Maximum Deletion Threshold	2160:00:00

The default threshold for purge is 90 days and FR\_DS\_PROCESS\_CS is only purged for domain\_type 'OPERATION'.

### Office Client

**Path:** System Administration > Shopfloor Connectivity

In order to define the caching time for reverse proxy, the new configuration is added "Cache TTL" when add/edit the Webservice. The cache value is defined in seconds.



System Administration > Shopfloor Connectivity

WebService Editor | SQL Browser | Filter Criteria | Data Formats

GenericProcessData

HumidityMeasurement

OEEReportWorkplace

OperationOverallPersonTimes

OperationPersonTimes

PressureMeasurement

QualityReportWorkplace

standardreports/hitlistoperatingstatesmat

standardreports/hitlistoperatingstateswor

standardreports/hitlistqualitydetailsmateri

standardreports/hitlistqualitydetailsworkp

standardreports/overallequipmentefficien

standardreports/overallprocessefficiency

standardreports/qualityreportmaterial

standardreports/qualityreportworkplace

standardreports/sumquantitiesoperation

16 elements found

Editor | Preview | Webservice

```

22 FROM FR_DS_PROCESS_LOG_GENERIC_FLO
23 WHERE @MeasurementSource(Measurement_Source)
24 AND @time_filter(TS,TS)
25 AND @Measurement(Measurement)
26 ) GPD
27 ORDER BY TS DESC

```

Collection

Column Identifier (SQL)	
MEASUREMENT_SOURCE	measurementSource
MEASURED_VALUE	measuredValue
ADDITIONAL_TEXT	additionalText
TS	ts
MEASUREMENT	measurement

Cache TTL 1000

## Inclusion of split information in FORCE MES FLEX messages

Affected module	Affected area	Status
ERP Connectivity / BridgeAPI	ERP Connectivity / BridgeAPI	New

With every message from FORCE FLEX MES, the split information will be included and sent. The split information is independent of if the split was performed in MES or ERP.

```
<OperationSplitIndicator>false</OperationSplitIndicator>
```

## Document Control

### Extension of Delta-Export (filtering)

Affected module	Affected area	Status
PDM/DNC	Delta-Export	New

Delta export can be now configured with filter configuration. This filter configuration is used to define a custom export which results in only those data being exported which matches with the configuration.

#### Configuration

New Filter Tab is developed to filter the delta export. User can add/delete the filters with the help of **+** or **-** buttons at row level.

Based on the filter type, the filter value selection is adapted. For example:

- Workplace filter type shows the workplace selection filter.
- Multiple selection is enabled for filters Material & Packet State with selection dialog.
- For the other filter types, user can set the string with wildcard characters.

#### Export functionality

The export will only be executed when a packet satisfies all the filter configuration, i.e., a packet has to satisfy **AND** condition. For example, all the packets will be exported if they meet the required criteria with workplace “90270” and **AND** packet state “Released”.

Multiple selection is enabled for filters Material & Packet State. When these filters allow multiple selections, a packet has to satisfy the **OR** condition. For instance, packets will be exported if they have either “Mat-01” or “Mat-05” as the material and they meet the OR condition.

## Appendix

Abbreviation/Term	Meaning
API	Application Programming Interface
DB	database
DNC	Distributed Numerical Control
DPB	Digital Planning Board
ERP	Enterprise Resource Planning
MDC	Machine Data Collection
MES	Manufacturing Execution System
NC	Numeric Control
NCP	NC Program
PDM	Production Data Management
SFT	Shopfloor Terminal
SQL	Structured Query Language
UUID	Universally Unique Identifier