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# What's New in Exensio ProcessControl 6.0-20250327

**Exensio Process Control Product Group** 

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### **Exensio ProcessControl Licensing Feature**

#### **FDC Data Collection**

- SBSS, PCE, PT
- DCB, PCA, IDE
- Non product wafer data collection

#### **Process Control (service/frontend)**

- Online FDC execution. Trace data loading, FilterPlan, SPC, OCAP
- □ Offline FDC execution. FilterPlan, SPC
- Analytics Foundation
- □ Search frame and trace/indicator viewing chart
- Manager base Equipment Type, Filter Plan, SPC Plan, OCAP, Artifact
- User Privileges Base
- Artifact Versioning
- Export / Import FDC model
- Custom Indicators
- □ SPC Offsets, WECO Rules, Auto-Limits Ad-hoc
- OCAP report in WebPlayer

### Advanced Control (frontend)

- for FDC Data Collections Module
- EDA (Interface-A)
- External Sensor Capability
- □ Versioning, Strategy Management

#### for Process Control module

- Auto Merge ET Manager
- Auto Indicator
- Virtual Sensors
- Custom Script Indicators
- Auto Retarget
- □ Scheduled Auto-Limits Offline Service
- Aggregation Manager Base
- Aggregation: Multivariate Analysis
- Aggregation: Wafer to wafer FDC
- □ Fab Migration Script (E-PC to E-PC model migration)
- **G** FSR Migration Script (Maestria to E-PC model migration)
- □ YAFDC: Export FDC indicators to Manufacturing Analytics
- □ SOAP API for SPC model management

#### **Process Control Guided Analytics (frontend)**

- □ Wafer Qualification Report
- Tool Matching Report

- Solution
  - □ Yield Aware FDC

(Future)

Trendviewer

Dashboard

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Process Control Big Data (backend)

**Gateway Export (service)** 

Automation and Reporting (Exensio Platform Module)

FDC Writer service

Trace Writer service

Trace Writer utility

**DP Monitor** 

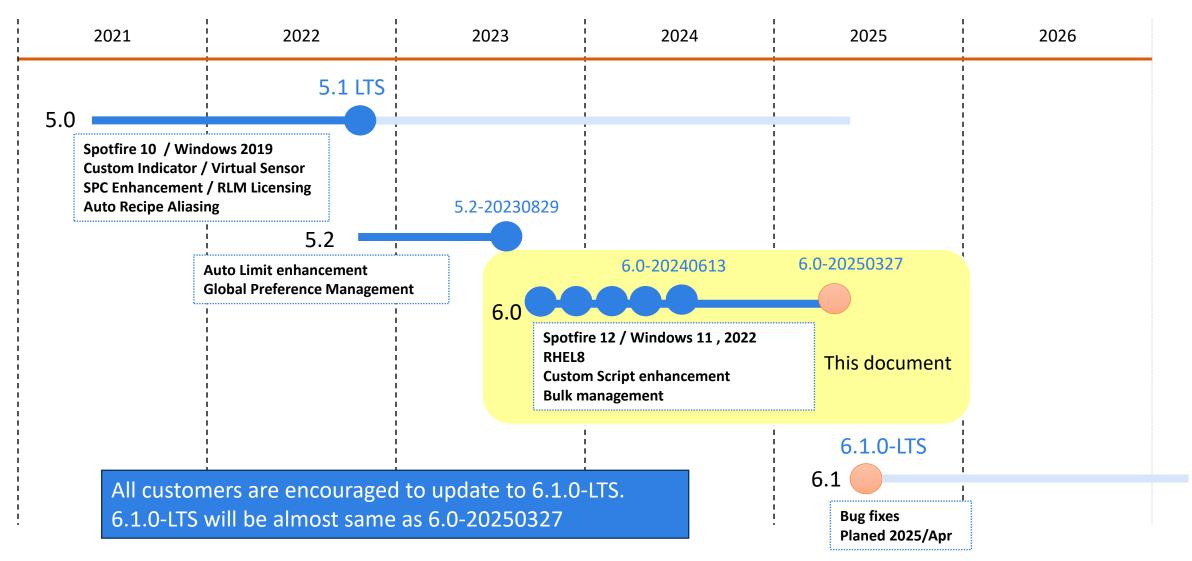
WebPlayer

Automation Services

Storage of trace data in Cassandra

Storage of Indicator data in Cassandra

### **Exensio ProcessControl Release History**



### **Summary of Bug Fix and Feature List**

#### **Modeling Improvement – Focusing on Useability**

Function Area	Feature	JIRA	Version
ET	Virtual Sensor Editor UI Improvements	EX-33149	6.0~6.0-20240613
Filter Plan	Temporal Trimming Timing Resolution	EX-33754	6.0~6.0-20240613
	Custom Script Improvement-1	EX-28663 EX-33250	6.0 ~ 6.0-20240613
	Custom Script Improvement-2	EX-29645 EX-37785 EX-33880 EX-37333	6.0-20250327
	Sensor Filtering for Auto Indicator	EX-37541	6.0-20250327
	Copy Indicator to the other Filter Plans	EX-33547	6.0-20250327
FilterPlan/SPC	Indicator Chart X axis options	EX-33349	6.0-20250327
OCAP	Include/Exclude Indictor Limitation Relaxed	EX-32711	6.0-20250327
	Disabling Actions	EX-32604	6.0~6.0-20240613
All	Artifact Selection Panel Enhancements	EX-31764	6.0~6.0-20240613

#### Function cleanup/Specification change

Function Area	Feature	JIRA	Version
Cleanup unused functions	ET: Data Collection Type is always "RTS"	EX-30533	6.0~6.0-20240613
	ET: Enable/Disable Recipe, Recipe Alias	EX-29895	6.0-20250327
	FP/SPC: remove notification page	EX-32659	6.0-20250327
Specification change	.fdc file format change	EX-36753	6.0-20250327
	Rollback unit of <b>**</b> Time statistics from second to milliseconds	EX-37334	6.0-20250327
Reliability	Online: reject too large trace data to prevent out of memory exception	EX-38984	6.0-20250327

#### **Database/Delete-Rename management**

Function Area	Feature	JIRA	Version
Database management	RemoveOldSpc Job	EX-33115	6.0~6.0-20240613
	mdbtools: Delete Filter Plan	EX-32372	6.0~6.0-20240613
	mdbtools: Delete SPC Plan	EX-36136	6.0-20250327
	Mdbtools: Delete Aggregation Plan	EX-36137	6.0-20250327
	Default Trace storage configuration	EX-32091	6.0-20250327
Delete/Rename management	ALL: "Deleted" Artifact State Renamed to "Deactivated"	EX-33854	6.0 ~ 6.0-20240613
	ET: Remove a recipe from the recipe alias	EX-29895	6.0-20250327
	ET: Remove a module from the module type	EX-20852	6.0-20250327
	Reject approved artifacts	EX-26288	6.0-20250327

#### Bulk update/API/Global Config

Function Area	Feature	JIRA	Version
Bulk update	Request For Production for Multiple Artifacts	EX-33896	6.0~6.0-20240613
	Bulk Import/Export artifacts. FP, OCAP in addition to SPC	EX-37925	6.0-20250327
	Import FilterPlan with misaligned sensors/indicators	EX-32101	6.0-20250327
Global Setting	Maximum Contexts to Load for Trace DoD	EX-30800, EX-14404	6.0~6.0-20240613
API	SPC API specification documented	EX-29398	6.0-20250327

### **Summary of Bug Fix and Feature List**

Area	🖸 Bug	🚹 Feature	Т:
PC-Backend	11	5	16
PC-Frontend	8	4	12
PC-Services	5	0	5
Total Unique Issues:	24	9	33

### **#1. Filter Plan – Custom Script update warnings**

When a custom script update operation is performed and the result is that a custom script indicator may be deleted or a function may otherwise be impacted, a warning message is now displayed, listing the affected filter plan name(s) and affected function(s), and asking for confirmation.

Confirm Custom Script Update (CustomScript_B)	)	×
Some Custom Script Indicators may be delet	ted as a result of this operation! Proceed anyway?	
Affected Filter Plans	Affected Functions	
BH_FilterPlanTest_ET-MT-RA BH_WindowsTest_ET-MT-RA	Function square TheInput_B was deleted.	<
	V Ok	Cancel

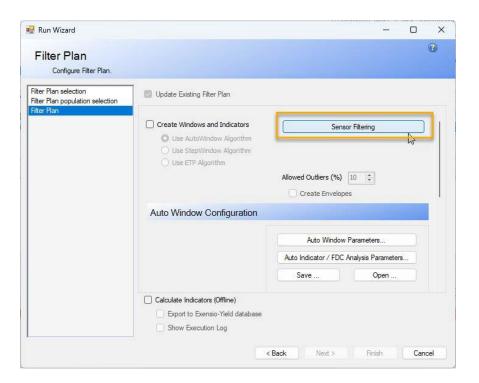
### **#2. Filter Plan – Custom Script Editing Privileges**

new Custom Script level of user privileges has been added. This setting allows administrators to define, for a given group, whether members of the group can or cannot edit and create custom groovy scripts. This is configurable in the User Privileges Manager, from the **Privileges** panel

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				RHEL7_Test_ET	-	SystemLevel	FDC_DATA_WRITE		
					Test_ET-MT-RA00	SystemLevel	FEAT_OCA_HOLD_READ		
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### **#3. Filter Plan – Sensor Filtering For Auto-Indicators**

- Now user can filter sensor for auto indicator generation
- "Set Priorities" button is deleted, and Sensor Filtering feature take over the capability in demo/full mode offline analysis



•	Sensor	Filtering	_		$\times$
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$\checkmark$		TRACE01			
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		TRACE03	 		
		TRACE04			
	] Check/	Uncheck All	OK	Ca	ncel

### **#4. Filter Plan – Copying indicators to other Filter Plans**

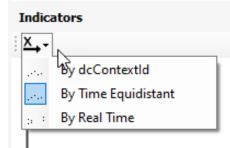
### User can copy multiple indicators from to multiple filter plans

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Name SENSORUJ-57_7 ID   Type Simple   Expressio     VS1-57_7Tb3e3-Me SImple   Simple   Simple     VS2-S7_7Tb3e3-Me SENSOR02-S8_8Tb SENSOR02-S8_8Tb SENSOR02-S8_8Tb SENSOR03-S8_9Tb SENSOR03-S9_9Tb SENSOR02-S9_9Tb SENSOR02-S9_9Tb SENSOR03-S9_9Tb Simple   Simple     VS1-S8_8Tb3e3-Me Simple   Simple     VS2-S8_8Tb3e3-Me Simple   Simple     VS1-S8_9Tb3e3-Me Simple   Simple     VS2-S9_9Tb SENSOR03-S9_9Tb Simple   Simple     VS1-S9_9Tb3e3-Me Simple   Simple	Image: Copy Indicators to   Create copy of indicators and add them to selected filter plans.   Equipment Type: BH_CopyTest2_ET   Module Type: MT   Apply to: Last Version   BH_CopyTest2_ET-MT-RA003 (17) BH_CopyTest2_ET-MT-RA003 (10)   BH_CopyTest2_ET-MT-RA005 (10) BH_CopyTest2_ET-MT-RA005 (10)   BH_CopyTest2_ET-MT-RA005 (9) BH_CopyTest2_ET-MT-RA005 (9)   BH_CopyTest2_ET-MT-RA005 (9) BH_CopyTest2_ET-MT-RA005 (10)   BH_CopyTest2_ET-MT-RA005 (10) BH_CopyTest2_ET-MT-RA005 (10)   BH_CopyTest2_ET-MT-RA005 (8) BH_CopyTest2_ET-MT-RA010 (8)   BH_CopyTest2_ET-MT-RA011 (8) BH_CopyTest2_ET-MT-RA011 (8)   BH_CopyTest2_ET-MT-RA011 (8) BH_CopyTest2_ET-MT-RA011 (8)   BH_CopyTest2_ET-MT-RA014 (8) BH_CopyTest2_ET-MT-RA014 (8)		×		name CustomScript_Floor: AutomScript_Max.C CustomScript_Max.C GetContex1 getAux GetContex1 getAux GetContex1 getPro GetContex1 getPro GetContex1 getPro GetContex1 getPro GetContex1 getPro CustomScript_Ceil.o CustomScript_18.Emp CustomScript 18.Emp CustomScript 18.Emp CustomScript 18.Emp CustomScript 18.Emp CustomScript 18.Emp	(inputSensor1) (indicator1) (inputSensor1) (inputSensor1) (inputSensor1) (inputSensor1) (inputSensor1) (inputSensor1) (inputSensor1) (indicator1) 0	description		ensor View   Window View   Advanced Window View Custom Indicator View
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### **#5. Filter Plan/SPC – X-axis option for indicator chart**

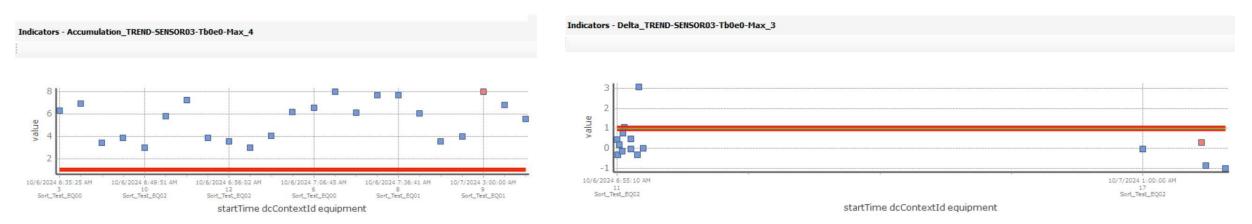
### 3 x-axis mode available

- By dcContextId
- By Time Equidistant (new)
- By Real Time(new)



#### X-axis by Time Equidistant

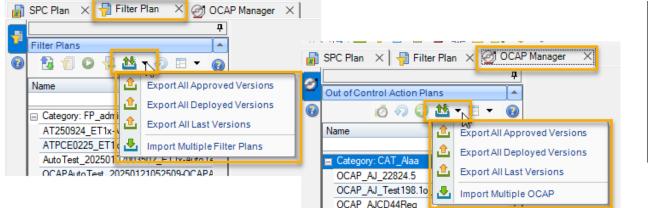
#### X-axis by Real Time

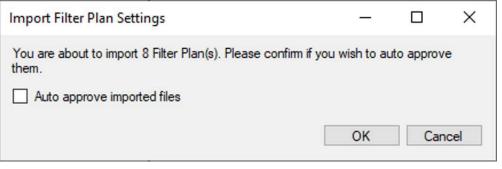


### **#6. Bulk Update – Model import/export**

### Bulk Import/Export for FilterPlan and OCAP

- Bulk import/export feature is now available for Filter Plan and OCAP in addition to SPC Plan
- Optionally, the imported artifacts can be approved





### Importing Filter Plan with misaligned Sensor/Indicators

In previous releases, users were unable to import a new filter plan from a different system when it referenced sensors/indicators that did not exist in the current system.

Now, importing handling missing sensor/indicators smartly to make import succeedful

### **#7. Global Setting – Maximum Contexts to Load for Trace DoD**

A new Process Control Global Settings category has been added as following

Global Settings				_		×
SPC Plan	DOD					
Filter Plan	Function	Parameter	Default	Max	N	
Aggregation Plan	Trace DOD	Population Size		3	5	
OCAP						
DOD						

- The Max limit applies to context selection in the Population grids when generating trace charts and FDC drill-down tables. The Max limit applies to
  - Search Frame
  - Filter Plan
  - SPC plan
  - FDC trace dod table

Po	Population								
Se	lect population	ns for chart filtering	and marking.			Show all MES rows			
	DC Context	Equipment	Equipment Type	Module	Recipe	Material ID	Start Time		
	1	ARTool_DPM_E10	ARTool_DPM_ET1x	MOD00	RECIPE00	00000.0_00000.0-05	2021-12-19		
	2	ARTool_DPM_E10	ARTool_DPM_ET1x	MOD00	RECIPE00	00000.0_00000.0-05	2021-12-20		
	3	ARTool_DPM_E10	ARTool_DPM_ET1x	MOD00	RECIPE00	00000.0_00000.0-06	2021-12-20		
	4	ARTool_DPM_E10	ARTool_DPM_ET1x	MOD00	RECIPE00	00000.0_00000.0-07	2021-12-20		
		3							

### **#8. Spec change – .fdc file format change**

The following file format changes have been made to the M2DP (E2DP) export file:

- **ModuleType** new text field. Represents the module type associated with the exported data.
- **DCQV** new column: Data Collection Quality Value.

<header-section> ProgClass 24 ProgGroup YA-FDC ProgName IND\_N.A.\_ChA\_DemoRecipe\_N.A Equipment Demo01 Equipment Type PM Retarget Demo Material Name NA Recipe DemoRecipe Physical Recipe NA Logical Recipe NA StartTime 2024/01/04 12:12:13.000 EndTime 2024/01/04 12:12:13 FPVersion 5 Strategy PM\_Retarget\_Demo-ChA-DemoRecipe StrategyUUID 31A9E4A2-BCC9-3A30-A141-BA0760F196EA Model NA FdcContextId 118569 DcContextId 288 ModuleType ChA Chamber ChA FilterPlanKey 42 AggregationPlanKey NA ControlJobId NA ProcessJobId NA ProcessJobName NA </header-section> <wafer-section> LOT NAME WAFER NAME AUX1 AUX2 TECHNOLOGY PRODUCT PROCESS STAGE STEP SlotNumber Route ProductFamily Carrier LotType SubRoute InputLoadPort ReticleName DemoLot14 DemoWafer14 UNDEFINED UNDEFINED N.A. N.A. NA N.A. N.A. NA N.A. UNDEFINED N.A. N.A. UNDEFINED NA UNDEFINED </wafer-section> <indicator-section> INDICATOR NAME VALUE LSL HSL LPL HPL LOL HOL DCQV PM Index-Tb0e0-Max 14.6 NA NA NA NA NA NA NA 1.0 SensorB-Tb0e0-Max 25.45 NA NA NA NA NA NA NA 1.0 SensorA-Tb0e0-Max 35.963 NA NA NA NA NA NA NA 1.0 </indicator-section> </data-file>

### **#9. Reliability – Online reject too large trace data**

- When online receive a large size of trace data, larger than JVM max memory size
- Before
  - Out Of Memory exception raised, and the online enters unstable status leading massive data loading missing.
- After
  - Check memory usage while reading trace chunk, if the usage > 60% of JVM max memory size, the online reject the context, and safely continue to process next contexts.

2025-Mar-24 03:29:26,216 - ERROR TID=Thread-5 (HornetQ-client-global-threads-1102677603) [com.pdf.online.service.impl.OnlineServiceImpl] Unable to process message : group = Data\_Load\_Test\_ET0x ; equipment = Data\_Load\_Test\_EQ00 ; module = null ; time = Mon Mar 24 03:29:18 PDT 2025 ; equipmentId = null ; moduleId = null ; pft\_key = null ; fp\_key = null ; fp\_key = null ; dcContextId = null ; fdcContextId = null cause = com.pdf.datastore.exception.DSTO\_Exception: High memory usage detected. Aborting the process. 2025-Mar-24 03:29:26,216 - DEBUG TID=Thread-5 (HornetQ-client-global-threads-1102677603) [com.pdf.common.service.impl.ServiceErrorHandlerImpl] Error is com.pdf.datastore.exception.DSTO\_Exception: High memory usage detected. Aborting the process. 2025-Mar-24 03:29:26,216 - DEBUG TID=Thread-5 (HornetQ-client-global-threads-1102677603) [com.pdf.common.service.impl.ServiceErrorHandlerImpl] Source message is HornetQMessage[null]:PERSISTENT

2025-Mar-24 03:29:26,217 - WARN TID=Thread-5 (HornetQ-client-global-threads-1102677603) [com.pdf.common.service.impl.ServiceErrorHandlerImpl] Recoverable error:com.pdf.datastore.exception.DSTO\_Exception: High memory usage detected. Aborting the process.

### **#10. Mdbtools – Delete models**

### #1 Delete Filter Plan by name

- - including associated SPC Plans

**NOTICE:** delete model will delete associated data from large history tables (FDCCONTEXT, TREATEDDATA, ...), and the processing time depends on the number of rows to delete.



### **#11. Database – RemoveOldSpc job**

### New maintenance job is added in FDC scheme

- RemoveOldSpc
- Scheduled: every day 9:30 AM
- target tables
  - SPC\_OFFSET\_PATTERN
  - SPC\_OFFSET
  - SPC\_DATA
  - SPC\_LIMIT\_RULE
  - SPC\_DATA\_RULE
  - SPC\_ELEMENT
  - SPC\_LIMIT\_SET

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### 3<sup>rd</sup> party module support matrix

Modules	Exensio 5.2	Exensio 6.0	Exensio 6.0-20250327	Exensio 6.1.x
Spotfire	10.10	12.0	12.0	12.0
Cassandra	3.11.15	4.1.4	4.1.4	4.1.4
Windows OS	7, 8.1, 10 Server 2012/2016/2019	10, 11 Server 2016/2019/2022	10, 11 Server 2016/2019/2022	10, 11 Server 2016/2019/2022
Linux OS	RHEL7.9	RHEL7.9	RHEL7.9 RHEL8.5-10	RHEL8.5-10 RHEL9.x (6.2.x)
Oracle client	12c for Windows 12c for RHEL7	12c for Windows 12c for RHEL7	19c for Windows 12c for RHEL7 19c for RHEL8	Oracle 19c
Oracle Database	12.2c, 19c	19c	19c	19c

Exensio 6.1.0-LTS will be the last version to support RHEL7 and Oracle client12

now

3<sup>rd</sup> party EOL

- Oracle 12 2022/07/31
- RHEL7 2024/06/30

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