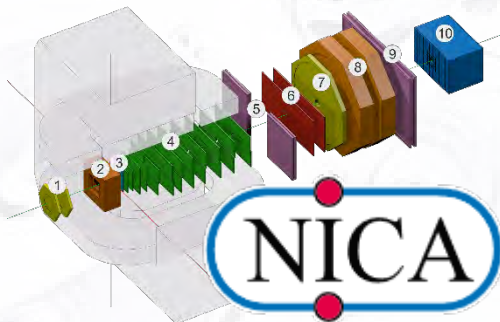


Integration Geometry and Configuration Information Systems into BM@N data processing

*E. Alexandrov¹, I. Alexandrov¹, A. Chebotov¹,
I. Filozova¹, K. Gertsenberger¹, D. Priakhina¹,
I. Romanov¹, G. Shestakova¹, A. Yakovlev¹*

¹JINR, Dubna



14th Collaboration Meeting of the
BM@N Experiment at the NICA Facility,
Dubna, VBLHEP JINR, 13-15 May, 2025



Joint Institute for Nuclear Research

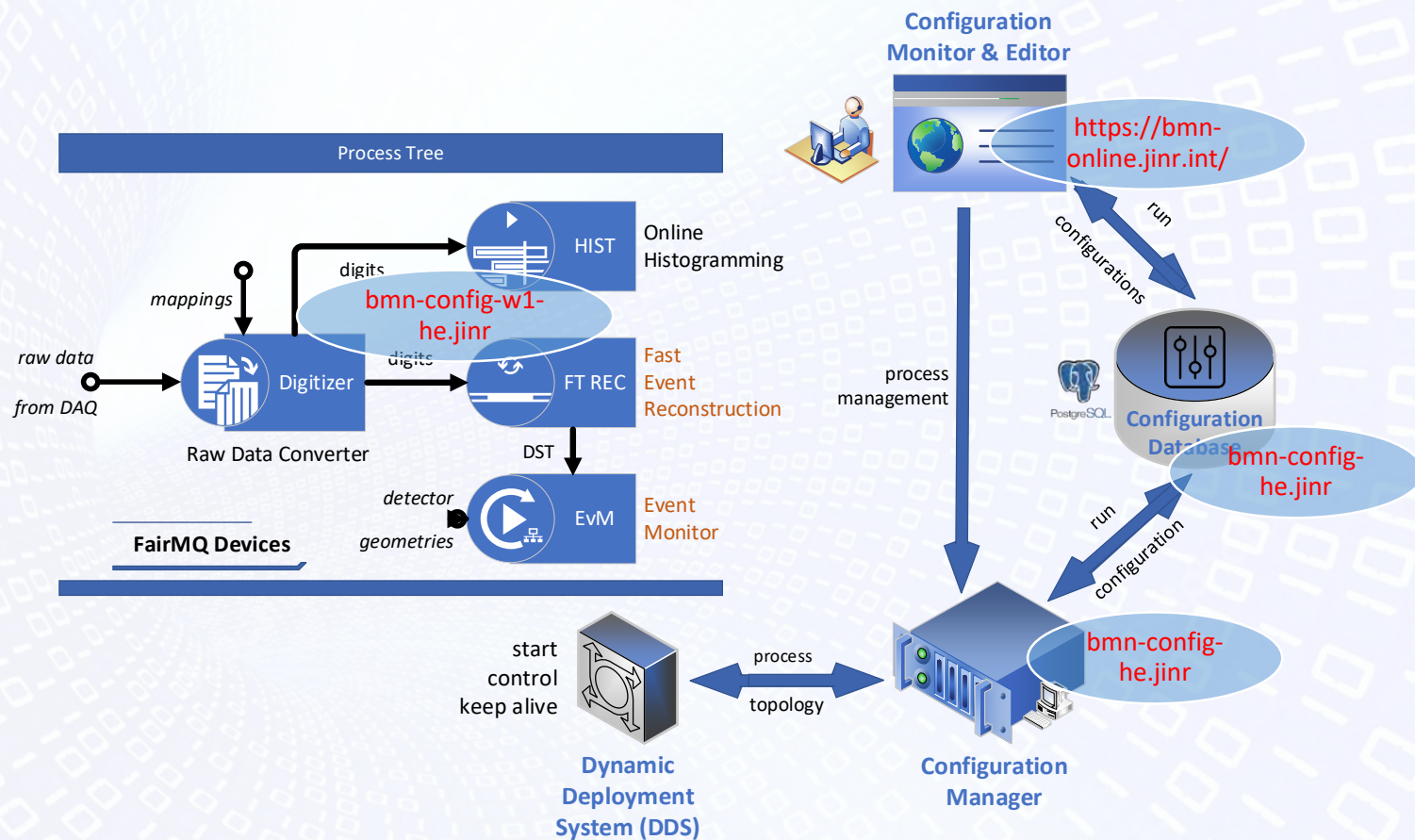


The Configuration Information System

Configuration: Possibilities


- can store and provide configuration data for online processing :
 - set of various detectors configuration parameters (working voltage etc.)
 - setup data including sequences of software tasks with their dependencies
- can start, stop and monitor setup tasks during experiment sessions
- can use web interface to supports data bases and operations with setup tasks

BM@N Configuration Information System and online processes diagram



Configuration Manager started panel.

Online processes to be controlled by Configuration manager

 Configuration System

Menu


TASK MONITOR

CONFIGURATION MANAGER


SESSION LOGS

DICTIONARY SET

Get in touch


 Konstantin Gertsenberger

© JINR VBLHEP-MUIT, 2025.
All rights reserved.

BM@N Configuration System 

User: admin_user [LOGOUT](#)

Run Manager

Select Setup Run: BM@N Test2 Run 8 

Control panel START STOP



Configuration Manager Logs

Created	Data	Status
2025-05-11 14:07:03	RestService::performRequest for command="stop" FINISHED!!	INFO
2025-05-11 14:07:03	STOP command finished	INFO
2025-05-11 14:07:03	RestService::writeHttpRes%%%%%%%% httpHeader=HTTP/1.1 200 OK Connection: keep-alive Content-Type: text/html; charset=utf-8 Content-Length: 30	DEBUG
2025-05-11 14:07:03	res=2 PGRES_TUPLES_OK=2 size=0 request= select id from log where session_id='578132de-a8be-4942-844c-4439a35c4d19' and task_id=-1 and status=0;	DEBUG
2025-05-11 14:07:03	!!!!ConfigurationSupport::putLogInDb(std::string& content... !!!!!!!!!!!!!	DEBUG
2025-05-11 14:07:03	!!!ConfigurationSupport::putLogInDb!!!!!!!!!!!!!!	DEBUG

Module Name

Parent Name

Actions

OnlineDataProcessing		 
----------------------	--	---

ADD SETUP MODULE

Configuration Manager tasks started panel.

BM@N Configuration System

Menu

TASK MONITOR

CONFIGURATION MANAGER

SESSION LOGS

DICTIONARY SET

Get in touch

Konstantin Gertsenberger

© JINR VBLHEP-MLIT, 2025.
All rights reserved.

BM@N Configuration System

User: admin_user [LOGOUT](#)

Run Manager

Select Setup Run: BM@N Test2 Run 8 [+](#)

Control panel [UPDATE](#) [STOP](#)

Host					
Task Name	Module	Status	Log	Start Time	End Time
Reconstruction_Processor	OnlineDataProcessing	Starting		2025-05-11 15:10:37	

Host

bm-n-config-w1

Task Name	Module	Status	Log	Start Time	End Time
Decoder	OnlineDataProcessing	Started		2025-05-11 15:10:37	
Decoder_Proxy	OnlineDataProcessing	Started		2025-05-11 15:10:37	

Configuration Manager Logs

Created	Data	Status
2025-05-11 15:10:43	LogSupport::removeRemoteFile: cmd="ssh ocs@bm-n-config-w1 'rm 5302-7fa3-2f59-af30'"	DEBUG
2025-05-11 15:10:43	LogSupport::readNumberFrFile line=11481 size=11481	DEBUG
2025-05-11 15:10:43	LogSupport::getRemoteFileSize 5: command=scp ocs@bm-n-config-w1:5302-7fa3-2f59-af30 5302-7fa3-2f59-af30 >/dev/null 2>/dev/null	DEBUG
2025-05-11 15:10:43	LogSupport::getRemoteFileSize 3: command with SHH: ssh ocs@bm-n-config-w1 "stat -c %s /home/ocs/504fc8e4-a541-45c5-84f9-dd320d1eea51/wn1/dds*.log >5302-7fa3-2f59-af30" 2>/dev/null	DEBUG
2025-05-11 15:10:43	LogSupport::getRemoteFileSize 2: command itself in quats="stat -c %s /home/ocs/504fc8e4-a541-45c5-84f9-dd320d1	DEBUG

Configuration: Session logs

← → ↺ bmn-online.jinr.int/page_sess_logs.php

☆ Bookmarks Темы диссертаций... Еурокубки в цифра... Флибуста | Книжно... VS | VegaSat.ru Open Source softwa... Directory Bind - 4... Hybrid MPI/OpenM... api.libreoffice.org/e... Подробная инстру...

BM@N Configuration System User: aleksand [LOGOUT](#)

Session Logs

Session	Setup:Run	Status	Log	Start Time	End Time	Update Time
140	BM@N Test2:8	Stopped		2025-05-07 12:44:24	2025-05-07 12:44:46	2025-05-07 12:44:46
139	BM@N Test2:8	Stopped		2025-04-30 14:48:43	2025-04-30 14:49:34	2025-04-30 14:49:34
138	BM@N Test2:8	Stopped		2025-04-30 10:42:46	2025-04-30 10:43:37	2025-04-30 10:43:37

Menu

- TASK MONITOR
- CONFIGURATION MANAGER
- SESSION LOGS
- DICTIONARY SET

Get in touch

[Konstantin Gertsenberger](#)

© JINR VBLHEP-MLIT, 2025. All rights reserved.

8fbfc5bf-100b-4b99-b459-69d1f69f0c9e.tar.gz (пробная копия)

Файл Команды Операции Избранное Параметры Справка

Добавить Извлечь... Тест Просмотр Удалить Найти Мастер Информация Антивирус

8fbfc5bf-100b-4b99-b459-69d1f69f0c9e.tar.gz - TAR+ GZIP архив, размер исходных файлов 11 488 байт

Имя	Размер	Сжат	Тип	Изменён	CRC32
..			Папка с файлами		
bmn-config-w1_wn1_dds_2025-05-07.0.log	11 488	?	Текстовый докум...	07.05.2025 15:44	

bmn-config-w1_wn1_dds_2025-05-07.0.log - Блокнот

Файл Правка Формат Вид Справка

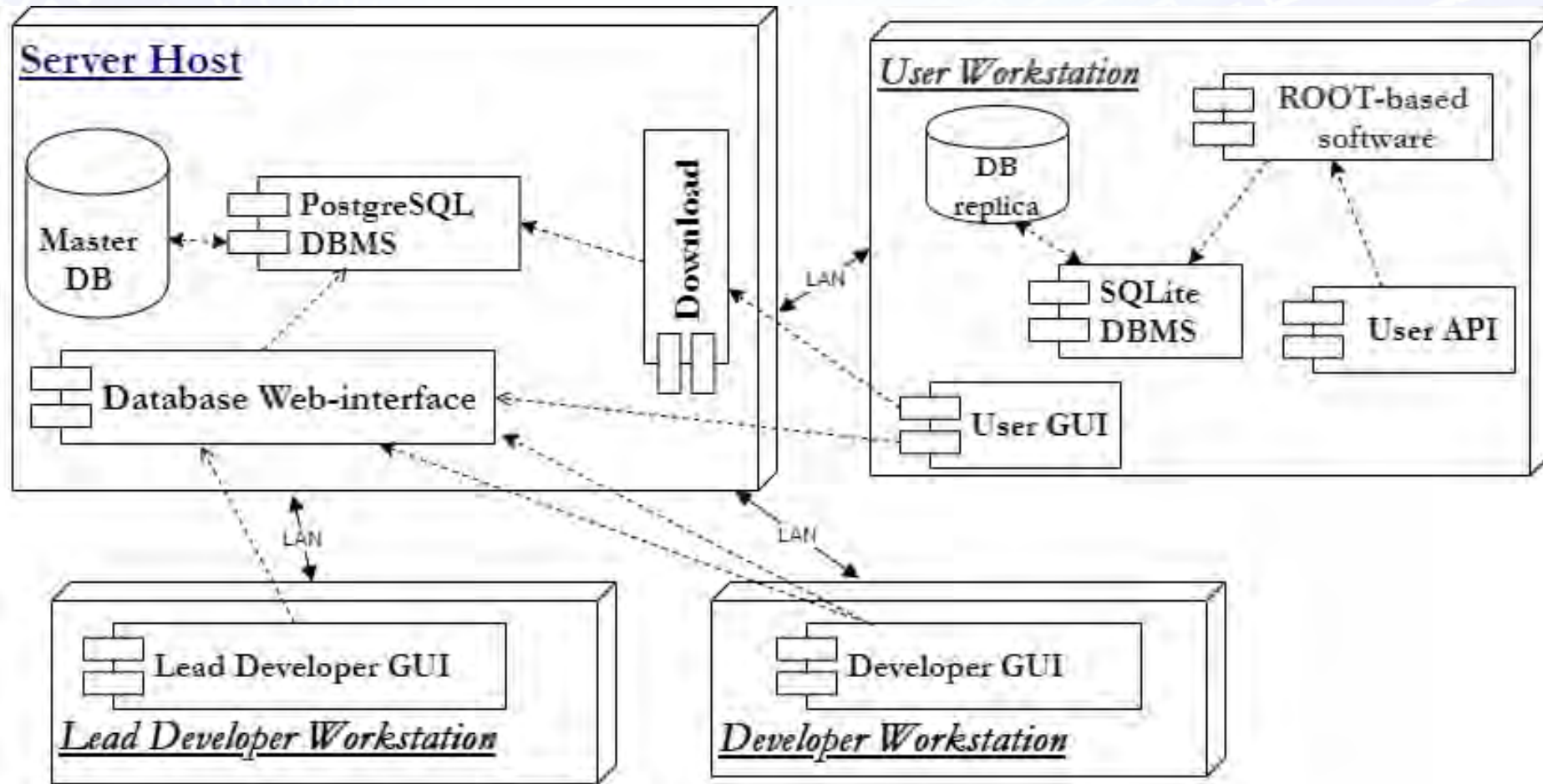
```
2025-05-07 15:44:28.394946 inf dds-agent <0x000f49db:0x00007fa89b2ce780> Log engine is initialized with severity "inf"
2025-05-07 15:44:28.395115 inf dds-agent <0x000f49db:0x00007fa89b2ce780> 1001947 (process ID) : 1001884 (process group ID) : 1001921(parent process ID)
2025-05-07 15:44:28.395185 cout dds-agent <0x000f49db:0x00007fa89b2ce780> DDS v3.7.22.12.gebb1261
DDS configuration v0.5
DDS protocol v2
Report bugs or comments to fairroot@gsi.de
2025-05-07 15:44:28.416476 inf dds-agent <0x000f49e2:0x00007f3405c37780> Log engine is initialized with severity "inf"
2025-05-07 15:44:28.416572 inf dds-agent <0x000f49e2:0x00007f3405c37780> 1001954 (process ID) : 1001884 (process group ID) : 1001921(parent process ID)
2025-05-07 15:44:28.416676 inf dds-agent <0x000f49e2:0x00007f3405c37780> SESSION ID file: /home/ocs/8fbfc5bf-100b-4b99-b459-69d1f69f0c9e/wn1/dds.sid
2025-05-07 15:44:28.416756 inf dds-agent <0x000f49e2:0x00007f3405c37780> SESSION ID: 8fbfc5bf-100b-4b99-b459-69d1f69f0c9e
2025-05-07 15:44:28.416912 inf dds-agent <0x000f49e2:0x00007f3405c37780> PROTOCOL HEADER ID: 9756955085291132685
2025-05-07 15:44:28.417083 inf dds-agent <0x000f49e2:0x00007f3405c37780> Reading server info from: /home/ocs/8fbfc5bf-100b-4b99-b459-69d1f69f0c9e/wn1/ser
2025-05-07 15:44:28.417176 inf dds-agent <0x000f49e2:0x00007f3405c37780> Contacting DDS commander on bmn-config:20000
2025-05-07 15:44:28.419018 inf dds-agent <0x000f49e2:0x00007f3405c37780> SM: Initializing input message queue: DDSAI-1001921-8fbfc5bf-1_0
2025-05-07 15:44:28.419320 inf dds-agent <0x000f49e2:0x00007f3405c37780> SM: Initializing input message queue: DDSAI-1001921-8fbfc5bf-1_1
```


Configuration System: Next steps

- **Wait for feedback on the results of work on run 9**
- **Update DDS ?**
- **Add Grafana monitoring of both Configuration manager itself and WEB components**
- **Moving to use REST API in all public communications**

The Geometry Information System

General architecture of the Geometry Information System



Main changes of the Geometry Information System

- Add viewing of geometry by web
- Deprecate revision for setup
 - Move revision to tag name
- Reconfiguration of DB for more simple support in future
 - Rename fields
 - Small changes on architecture
 - Do Tag of setup is case independency
- Add macros for upload setup by tag
- Auto download version by tag if selected version is not exists in local repository

Status of the Geometry Information System

Geometry server is available and last versions are uploaded: <https://bmn-geometry.jinr.ru/>

BM@N Geometry DataBase

User: aleksand

CONFIGURE USER ACCESS

LOGOUT

Geometry Setups

Tag	Revision	Date	Description	Author	Status	Last Modified	Download Setup	Actions
run8_dev_25.12.05	1	2025-05-12 16:20	run8 for branch dev from 12/05/2025	aleksand	Approved	2025-05-12 16:21		
run8_25.04.0	1	2025-05-12 12:25	run8 for branch 25.04.0	aleksand	Approved	2025-05-12 16:23		
run8_24.12.0	1	2025-05-07 18:07	run8 for branch 24.12.0	aleksand	Approved	2025-05-12 12:49		

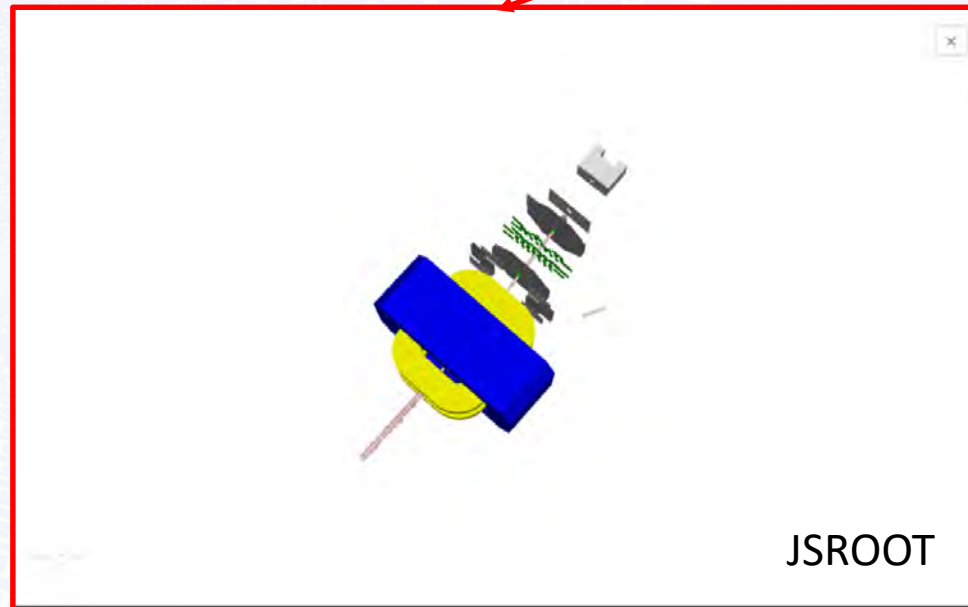
Production versions

[Run8_24.12.0](#) and

[Run8_25.04.0](#).

Developer version

[Dev_11.05.2025](#)



GUI: add material and field

The screenshot displays the BM@N Geometry DataBase web interface. The browser address bar shows `bm-geometry.jinr.int/page_editm.php`. The page header includes the site logo, user information (`User: aleksand`), and links for `CONFIGURE USER ACCESS` and `LOGOUT`.

Material Files Section:

You can edit the **Description** field. A new value is saved when the focus is lost.

[CREATE NEW MATERIAL](#)

Tag	Date	Author	Description	
media_24.12	2025-05-06 17:24	aleksand	media_24.12	X

Material Tag* Description*

[Choose file](#)

No file chosen

[ADD MATERIAL](#) [CANCEL](#)

Magnetic Fields Section:

You can edit the **Description** field. A new value is saved when the focus is lost.

[CREATE NEW FIELD](#)

Magnetic Field Tag	Date	Author	X	Y	Z	Scale	Description	
FieldMap_1900_extrap_noPed	2025-05-07 18:01	aleksand	0	0	0	0.929	FieldMap_1900_extrap_noPed.root	X

Magnetic Const Fields Section:

You can edit the **Description** field. A new value is saved when the focus is lost.

[CREATE NEW CONST FIELD](#)

Magnetic Field Tag	Date	Author	bx	by	bz	xmin	xmax	ymin	ymax	zmin	zmax	Description	
--------------------	------	--------	----	----	----	------	------	------	------	------	------	-------------	--

GUI: add module

Menu

HOME

VIEW GEOMETRY

EDIT GEOMETRY

EDIT SETUP

EDIT SETUP MODULES

EDIT GEOMETRY FILES

EDIT MODULES

Geometry Modules

You can edit the **Description** field. A new value is saved when the focus is lost.

CREATE NEW MODULE

Module Name	Revision	On/Off	Object Name	Class Name	Sensitivity	Author	Date	Add Revision
BD	1	<input checked="" type="checkbox"/>	BD	BmnBd	Active	aleksand	2025-05-07 17:14	<input data-bbox="1812 411 1850 445" type="button" value="+"/>
CAVE	1	<input checked="" type="checkbox"/>	CAVE	FairCave	Passive	administrator	2025-05-05 16:16	<input data-bbox="1812 474 1850 508" type="button" value="+"/>
CSC	1	<input checked="" type="checkbox"/>	CSC	BmnCSC	Active	aleksand	2025-05-07 17:19	<input data-bbox="1812 536 1850 571" type="button" value="+"/>
DCH	1	<input checked="" type="checkbox"/>	DCH	BmnDch	Active	aleksand	2025-05-07 17:21	<input data-bbox="1812 599 1850 634" type="button" value="+"/>
FD	1							
FHCAL	1							
HODO	1							

BM@N Geometry DataBase

Module Type: BD	Object Name: <input type="text" value="BD"/>	Revision Number:* <input type="text" value="2"/>
Class Name:* <input type="text" value="BmnBd"/>		

Module Name* <input type="text"/>	
Object Name* <input type="text"/>	Revision Number* <input type="text" value="1"/>
Sensitivity* <input type="text" value="Active"/>	Class Name* <input type="text" value="Bmn"/>

GUI: add file and setup module

EDIT GEOMETRY

EDIT SETUP

EDIT SETUP MODULES

EDIT GEOMETRY FILES

EDIT MODULES

EDIT MATERIALS

EDIT MAGNETIC FIELDS

HODO	1	BmnHodo	Hodo_for_run8_rev_24_12		2025-05-07 17:26	aleksand	Hodo_for_run8_with_box_Zpos_970.2cm_Xshift_64.90cm_Yshift_-1.0cm_rotationY_1.6deg_v1.root	
MAGNET	1	FairMagnet	magnet_modified		2025-05-07 17:05	aleksand	magnet_modified.root	
NDET	1	BmnNdet	nDet_PROT_O_ONEDET_run8_rev_24_12		2025-05-07 17:30	aleksand	nDet_PROTOTYPE_ONEDT_12x12cm_9slices_4x4cm_with_rows_columns_NEW_NUMBERING_VETO_25mm_5slices_PLA_2mm_Pb_8mm_9slices_Cu_30mm_Sc_25mm_G10_2mm_Air_no_hole_ZdistDET_1_595.617cm_Ysh_0.518cm_rotY_-27.30deg_rotX_0.0deg.root	

CREATE NEW FILE

Setup Module Tag*

Description*

Module*

Parent Module

File with the Module*

File with the Parent Module

BD_run8_v1

Transformations:

r11: 1
r21: 0
r31: 0

r12: 0
r22: 1
r32: 0

r13: 0
r23: 0
r33: 1

Translation:

X: 0

Y: 0

Z: 0

Parameter File:

Choose file

No file chosen

ADD A NEW ENTRY WHOLE

CANCEL

File Tag*

Description*

Module*

Class Name / Revision

Select here

Select here

BD

CAVE

CSC

DCH

FD

Choose file

No file chosen

ADD FILE

CANCEL

Setup Modules

You can edit the **Description** field. A new value is saved when the focus is lost.

CREATE NEW SETUP MODULE

Module	Name (Tag)	Date	File	Transformation	Parent	Author	ParFile	Description	
BD	BD_run8_v1	2025-05-07 17:45	BD_run8_v1		CAVE	aleksand		BD_run8_v1	
CAVE	cave	2025-05-05 16:17	cave		none	administrator		Base cave	
CSC	FullCSC_Run8_detailed	2025-05-07 17:51	FullCSC_Run8_detailed		CAVE	aleksand		FullCSC_Run8_detailed	

GUI: add setup

Setup Tag *

Description *

Setup Modules

CAVE

MAGNET

Target

Pipe

	Type	Tag	Date	Author	File Tag	Transformation	Parent	Description
<input type="checkbox"/>	Pipe	VacuumPipe_section3_Run8	2025-05-07 17:10	aleksand	VacuumPipe_section2_Run8	<div><div>1.0000.0000.0000.0000</div><div>0.0001.0000.0000.0000</div><div>0.0000.00001.0000.0000</div></div>	CAVE	VacuumPipe_section3_Run8.root
<input type="checkbox"/>	Pipe	VacuumPipe_section2_Run8	2025-05-07 17:09	aleksand	VacuumPipe_section2_Run8	<div><div>1.0000.0000.0000.0000</div><div>0.0001.0000.0000.0000</div><div>0.0000.00001.0000.0000</div></div>	CAVE	VacuumPipe_section2_Run8.root
<input type="checkbox"/>	Pipe	VacuumPipe_section1_Run8	2025-05-07 17:08	aleksand	VacuumPipe_section1_Run8	<div><div>1.0000.0000.0000.0000</div><div>0.0001.0000.0000.0000</div><div>0.0000.00001.0000.0000</div></div>	CAVE	VacuumPipe_section1_Run8.root

SIBT

FHCAL

Magnetic Fields

	Tag	Date	Author	X	Y	Z	Scale	Description
<input checked="" type="radio"/>	FieldMap_1900_extrap_noPed	2025-05-07 18:01	aleksand	0.000	0.000	0.000	0.929	FieldMap_1900_extrap_noPed.root

Magnetic Const Fields

Tag	Date	Author	X	Y	Z	Field Values	Description
-----	------	--------	---	---	---	--------------	-------------

Geometry Materials

Tag	Date	Author	Description
<input checked="" type="radio"/> media_24.12	2025-05-06 17:24	aleksand	media_24.12

Full Setup Geometry

Choose file

No file chosen

ADD SETUP

CANCEL

API

- `int LoadSetupToGeoManager(string_view setup_tag);` // 0 - loaded, not 0 – error code
 - It will try to upload geometry from server if local db has not this tag
- `int LoadSetupToFairRunSim(string_view setup_tag);` // 0 - loaded, not 0 – error code
 - It will try to upload geometry from server if local db has not this tag
- `FairField* GetMagneticField(double scale = 0);` // nullptr – no Field
- `string_view GetParameterFile(string_view detector_name);` // "" – no parameter file

Geometry System: Next steps

- **Wait for feedback on branch with DB**
- **Merge branch to main git (no any changes for users after merge)**
- **Moving to use REST API in all public communications**