



**EUROPEAN
SPALLATION
SOURCE**



Motion Control & Automation (MCA)

System Acceptance Review ESTIA

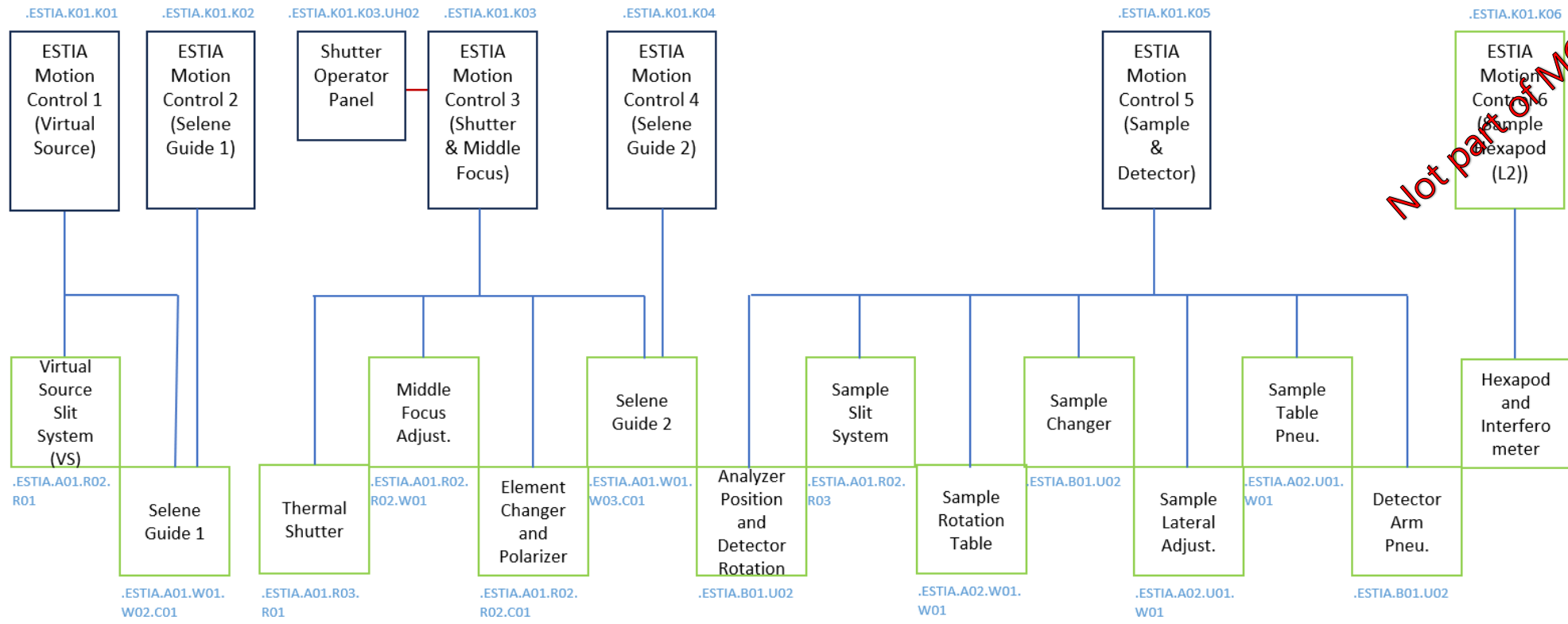
**PRESENTED BY FEDERICO ROJAS
(ON BEHALF OF THE MOTION CONTROL & AUTOMATION GROUP)**

2026-06-10

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ESTIA Local Test System Overview



Not part of MCAG

MCA Control System	Connected Instrument Subsystems	Test Reports	Status
MC1 Shutter	Virtual Source, Temperature Sensors SG1	ESS-6004915	Passed
MC2 Selene Guide 1	Selene Guide 1: Support, Metrology Cart and Robot	ESS-6005336	Passed
MC3 Shutter & Middle Focus	Instrument Thermal Shutter, Mask Changer, Polarizer and Temperature Sensors SG2	ESS-6005442	Passed
MC4 Selene Guide 2	Selene Guide 2: Support, Metrology Cart and Robot	ESS-6006414	Passed w/ Minor Issues
MC5 Sample & Detector	Sample Slits, Sample Rotation, Analyzer, Detector Arm, SE patch panel	ESS-6006529	Passed w/ Issues

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ESTIA Local Test (SAT 1) – MC 1 (Virtual Source) Report ESS-6004915

System name	FBS	FAT/DAT Status	SAT1 Status	Issue Tracker	Issues	To be fixed before
Virtual Source	ESTIA.A01.R02.R01.R01	No issues	No issues	N/A		
Temperature Sensors SG 1	ESTIA.A01.W01.W02	No issues	No issues	N/A		
MCC1	ESTIA.K01.K01	No issues	Minor issues	NIT-789	As-built Drawings	TG6/ORR

- Test cases for motion control functionality passed.
- Slit control implemented in NICOS.
- All 12 temperature sensors read correctly.

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ESTIA Local Test (SAT 1) – MC 2 (Selene Guide 1)

Report ESS-6005336



System name	FBS	FAT/DAT Status	SAT1 Status	Issue Tracker	Issues	To be fixed before
SG1 Adjustable Support Structure	ESTIA.A01.W01.W02.U01	No issues	No issues	N/A		
SG1 Mirror Adjustment Robot	ESTIA.A01.W01.W02.W01	No issues	No issues	N/A		
SG1 Mirror Measurement Cart	ESTIA.A01.W01.W02.W02	No issues	No issues	NIT-817	Absolute positioning needs the interferometer	TG5/iSAR
MCC2	ESTIA.K01.K02	No issues	Minor issues	NIT-789	As-built Drawings	TG6/ORR

- Test cases for motion control functionality passed.
- Coordinate transformation for Support Structure running in NICOS.
- Mirrors adjustment screws positions found and saved with script in NICOS.
- Absolute positioning of Measurement Cart needs the interferometer reading.

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ESTIA Local Test (SAT 1) – MC 3 (Shutter & Middle Focus) Report ESS-6005442



System name	FBS	FAT/DAT Status	SAT1 Status	Issue Tracker	Issues	To be fixed before
ESTIA Thermal Shutter	ESTIA.A01.R03.R01	No issues	Minor issues	NIT-782	For safety reasons the air supply design needed to be changed. Once the new design is implemented, the shutter will be retested to adjust opening and closing times if needed.	TG6/ORR
Rotary In-Beam Element Changer	ESTIA.A01.R02.R02.GM01	No issues	No issues	N/A		
Alignment for Rotary In-Beam Changer	ESTIA.A01.R02.R02.W01	No issues	No issues	N/A		

- Shutter design changed for safety reasons; the shutter will be retested to adjust closing and opening times if needed.
- Mask changer positions saved for the Rotary In-Beam Changer and its alignment axes.

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ESTIA Local Test (SAT 1) – MC 3 (Shutter & Middle Focus) Report ESS-6005442

System name	FBS	FAT/DAT Status	SAT1 Status	Issue Tracker	Issues	To be fixed before
Linear In-Beam Element Changer	ESTIA.A01.R04.GM01	No issues	No issues	N/A		
Temperature Sensors SG 2	ESTIA.A01.W01.W03	No issues	No issues	N/A		
MCC3	ESTIA.K01.K03	No issues	Minor issues	NIT-789	As-built Drawings	TG6/ORR

- Position of the polarizer guide saved.
- All 12 temperature sensors read correctly.

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ESTIA Local Test (SAT 1) – MC 4 (Selene Guide 2)

Report ESS-6006414



System name	FBS	FAT/DAT Status	SAT1 Status	Issue Tracker	Issues	To be fixed before
SG2 Adjustable Support Structure	ESTIA.A01.W01.W03.U01	No issues	No issues	N/A		
SG2 Mirror Adjustment Robot	ESTIA.A01.W01.W03.W01	No issues	No issues	N/A		
SG2 Mirror Measurement Cart	ESTIA.A01.W01.W03.W02	No issues	No issues	NIT-817	Absolute positioning needs the interferometer	
MCC4	ESTIA.K01.K04	No issues	Minor issues	NIT-789	As-built Drawings	TG6/ORR

- Test cases for motion control functionality passed.
- Coordinate transformation for Support Structure running in NICOS.
- Mirrors adjustment screws positions found and saved with script in NICOS.
- Absolute positioning of Measurement Cart needs the interferometer reading.

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ESTIA Local Test (SAT 1) – MC 5 (Sample & Detector) Report ESS-6006529



System name	FBS	FAT/DAT Status	SAT1 Status	Issue Tracker	Issues	To be fixed before
Sample Slits	ESTIA.A01.R02.R03	No issues	No issues	N/A		
Sample Lateral Adjustment	ESTIA.A01.W01.W02	No issues	No issues	N/A		
Sample Support Structure on Air Pads	ESTIA.A02.U01	N/A	Minor issues	NIT-787	Manual air pad control and status from NICOS	TG5/iSAR
Sample Rotation Table	ESTIA.A02.W01.W01	No issues	Minor issues	NIT-791	Needs dynamic soft limits based on SE	TG6/ORR

- Test cases for motion control functionality passed.
- Slit gap and center control implemented in NICOS.
- Manual controls ready to be deployed and tested after motion safety tests are concluded.
- Strategy and implementation of dynamic soft limits for sample rotation table needs to be agreed with the instrument team and ECDC.

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ESTIA Local Test (SAT 1) – MC 5 (Sample & Detector) Report ESS-6006529



System name	FBS	FAT/DAT Status	SAT1 Status	Issue Tracker	Issues	To be fixed before
Detector Motion System	ESTIA.B01.W02	N/A	No issues			
Detector Arm Support Structure on Air Pads	ESTIA.B01.U01	N/A	Minor issues	NIT-787	Manual air pad control and status from NICOS	TG5/iSAR
Analyser In-Beam Positioning	ESTIA.B01.B02.W01	No issues	No issues			

- Test cases for motion control functionality passed.
- Detector arm motion system needs to be tested once motion safety and NIT-787 are done.

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ESTIA Local Test (SAT 1) – MC 5 (Sample & Detector) Report ESS-6006529

System name	FBS	FAT/DAT Status	SAT1 Status	Issue Tracker	Issues	To be fixed before
Room Temperature Sample Changer	ESTIA.A02.W01 .W02	No issues	No issues	N/A		
Solid/liquid cell sample changer	N/A	No issues	No issues	N/A	Part of the SE patch panel test channel 1. Not defined if subsystem is SE or ESTIA. Currently not included in ESTIA ePlan drawings.	
SE patch panel free channels	ESTIA.K01.K05. X01	N/A	Minor issues	NIT-790	Part of the SE patch panel test, cabling needs to change for BiSS-C encoders	TG6/ORR
MCC5	ESTIA.K01.K05	No issues	Minor issues	NIT-789	As-built Drawings	TG6/ORR

- Test cases for motion control functionality passed.
- Channel 1 in SE will be shared for both RT and Solid/liquid sample changer for now, except that they have different homing sequences requirements.
- Channel 2-4 of SE patch panel will be tested with RT sample changer once NIT-790 is complete.

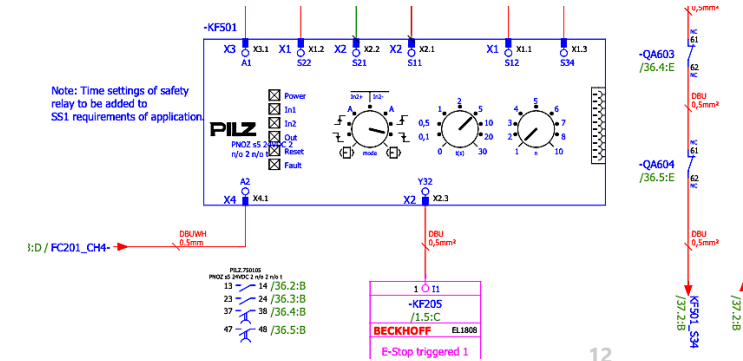
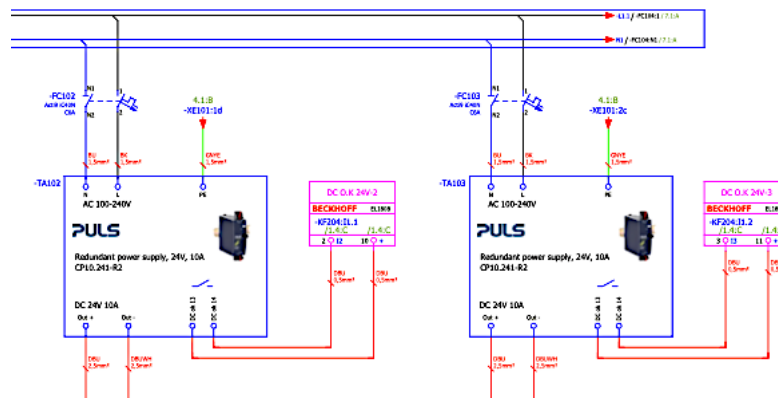
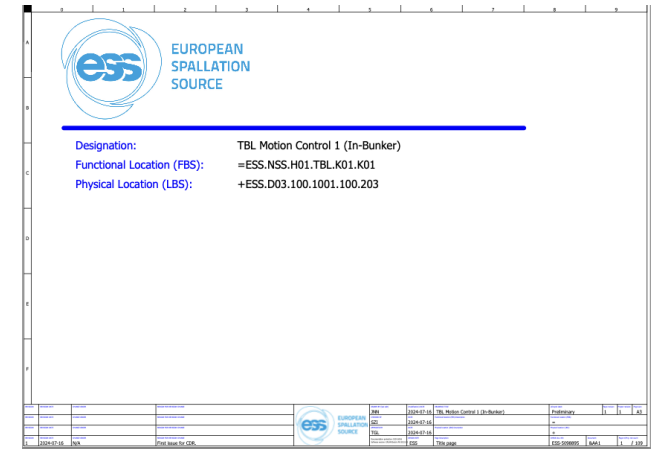
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ESTIA Local Test (SAT 1) – ePlan documentation (NIT-789)

- For each motion system an electrical documentation package has been issued (ePlan drawing, BOM, fuse chart, cable list etc.)
- Drawings include the controll cabinet, external boxes, motion safety circuits and all instrument sub-systems connected.
- Drawings have been iterated after the changes and adaptations during the local and integrated tests and the implementation of the safety circuit. As-built drawings will be available for operation.

- ESTIA MC 1 ESS-5337417
- ESTIA MC 2 ESS-5337418
- ESTIA MC 3 ESS-5337419
- ESTIA MC 4 ESS-5337420
- ESTIA MC 5 ESS-5337421



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ESTIA Local Test (SAT 1) – Summary

- All test cases for motion control functionality and performance passed.
- Thermal shutter retesting is only to check that opening and closing times are not affected by new design.
- Detector arm issues do not affect the functionality of the instrument; however, they do affect the user experience and interface.
- Dynamic soft limits for sample stage need to be define to avoid collision risk of the SE and other instrument subsystems.
- Finalizing as-built drawings is a constant effort until operations.
- Tickets filed in the NSS Issue Tracker (NIT):
<https://jira.ess.eu/secure/Dashboard.jspa?selectPageId=28900>
 - NIT-782: Retest ESTIA Thermal shutter To Do ORR
 - NIT-787: Add Air Pads status and errors In Progress iSAR
 - NIT-789: ESTIA: As-built drawings In Progress ORR
 - NIT-790: ESTIA: Test SE Patch Panel channels To Do ORR
 - NIT-791: ESTIA: Sample Rotation dynamic soft limits To Do ORR

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ESTIA Local Test (SAT 1) – Next steps

- After fixing the relevant NIT issues, the motion control systems for ESTIA are ready for operation in Hot Commissioning.
- MCA group is planning to support hot commissioning with these activities:
 - Support instrument team with motion related issues.
 - Technician support if requested.
 - Engineering support if requested.
- User and maintenance manuals for the cabinets are available:
 - ESS-5483415 - Service & Maintenance Plan for MCA Cabinets and Boxes
 - ESS-5669197 - Operation Manual - MCU6001: Shutter Motion Control Cabinet
 - ESS-5669198 - Operation Manual - MCU5001: 16Ax. Motion Control Cabinet
 - ESS-5669199 - Operation Manual - MCU5002: Servo Motion Control Cabinet
 - ESS-5669200 - Operation Manual - MCU5003: Piezo Motion Control Cabinet
- No displaced working hours or on-call support planned.



Thank You!

2026-06-10