



# System Acceptance Review meeting for DREAM

**DREAM Neutron Detector System & Detector Electronics**

ESS.NSS.H01.DREAM.B01.B01 & ESS.NSS.H01.DREAM.B01.C01

PRESENTED BY IRINA STEFANESCU

2026-03-26

# DREAM SAR – Detector Report



System name	FBS	Operation manuals	FAT reports	SAT reports	Compliance
Neutron Detector System	DREAM.B01.B01	<a href="#">ESS-5355487</a> <a href="#">ESS-5094821</a> <a href="#">ESS-5584951</a>	<a href="#">ESS-5167269</a> <a href="#">ESS-5830014</a> <a href="#">ESS-5830016</a>	<a href="#">ESS-5988187</a> (local) <a href="#">ESS-6017703</a> (integrated)	All detector systems (detector + readout) are CE marked.
Neutron Detector Electronics	DREAM.B01.C01	<a href="#">ESS-3872531</a>			

System purpose: detect the scattered neutrons coming from the sample

Day-1 scope:

InKind, FZJ, Germany

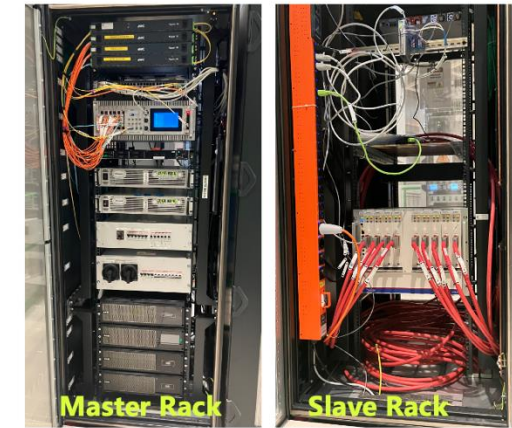
- 64 EndCap detector modules
- 5 Mantle modules
- 69 cuboids
- Detector cables (HV, LV) , breakout boxes
- HV power supply (Iseg), LV power supplies (TDK Lambda)

Detector Group contribution, CR 13.160 (ESS-5715351)

- 2 electrical cabinets (nVent)
- UPS (EATON)
- Readout Master Module (RMM)



**Cuboids, half-frame  
HR & SANS**



**DREAM Detector Racks**

5 detector sub-systems: EndCap Backward, EndCap Forward, Mantle, SANS, High-Resolution

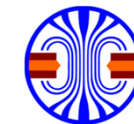
6 different designs: cuboids, Mantle segments, SUMO3, SUMO4, SUMO5, SUMO6

Detector technology: wire counters with B-10-coated cathodes (“Jalousie”)

Designed and manufactured by CDT, Heidelberg, Germany

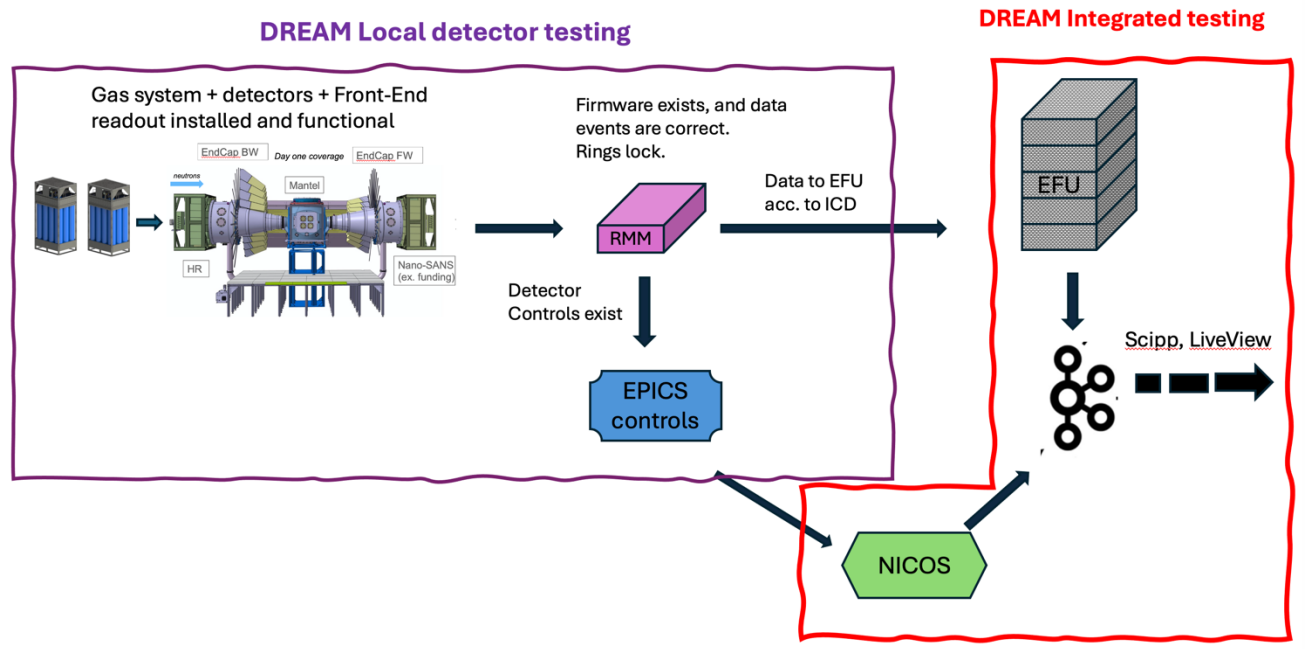
Status:

Equipment delivered and installed



**CDT  
CASCADE Detector  
Technologies  
GmbH**

# DREAM SAR – Detector Report



Local tests performed between Oct 2025 and January 2026

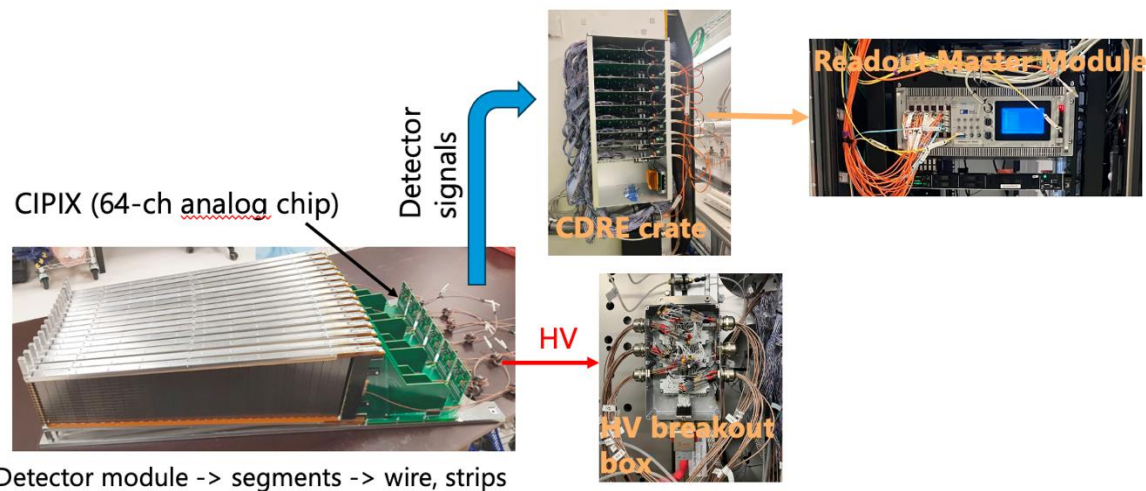
- Test plan [ESS-5826183](#)
- Test report [ESS-5988187](#)

Test cases		Pass/Fail
1.	Verification of system document completeness.  3 test cases planned.	<b>All tests passed.</b>
2.	Inspections (hardware). Performed with the manufacturer’s (CDT) firmware and detector control.  11 test cases planned.	<b>10 tests passed.</b>  <b>1 test failed (see next slide)</b>
3.	Interface for detector control and monitoring (CDT&ESS firmware and ESS software).  9 test cases planned.	<b>7 tests passed.</b>  <b>2 tests failed (see next slides)</b>

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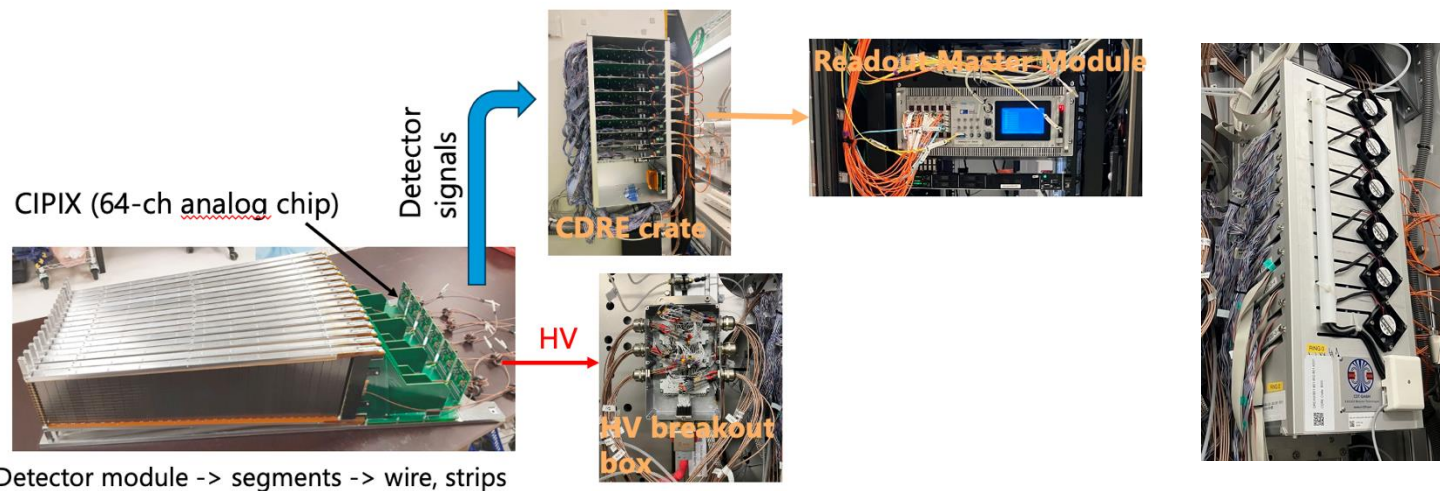
	Failed test cases	NIT	Comments
2	<p><b>Inspections (hardware)</b></p> <p>Failed test 2.11: All detector modules are operational.</p>	<p><a href="#">NIT-651</a> - CIPIX error, SUMO5, Ring 1 / FEN1 (EndCap BW, Sector 9)</p> <p>CIPIX – the analogue 64-ch chip performing preamplification and discrimination of the raw signals from the detector.</p> <p><a href="#">NIT-632</a> - CDRE boards are overheating.</p> <p><a href="#">NIT-627</a> - HV issues for the detectors (6 cuboids, 1x SUMO4, 1 Mantle segment).</p> <p><a href="#">NIT-625</a> - Spurious signals (EM interference) observed in the EndCap detector modules.</p>	<p>The manufacturer (CDT) suspects issues in the I2C communication protocol between the chip and the readout board. Suggested a modification of the CDT part of the firmware.</p> <p>Installed active cooling (fans) on the covers of the crates hosting the boards.</p> <p>The manufacturer is informed. Discussions with the instrument team ongoing.</p> <p>The manufacturer installed a RC-filter (low-pass filter) in the HV breakout boxes.</p>



# DREAM SAR – Detector Report



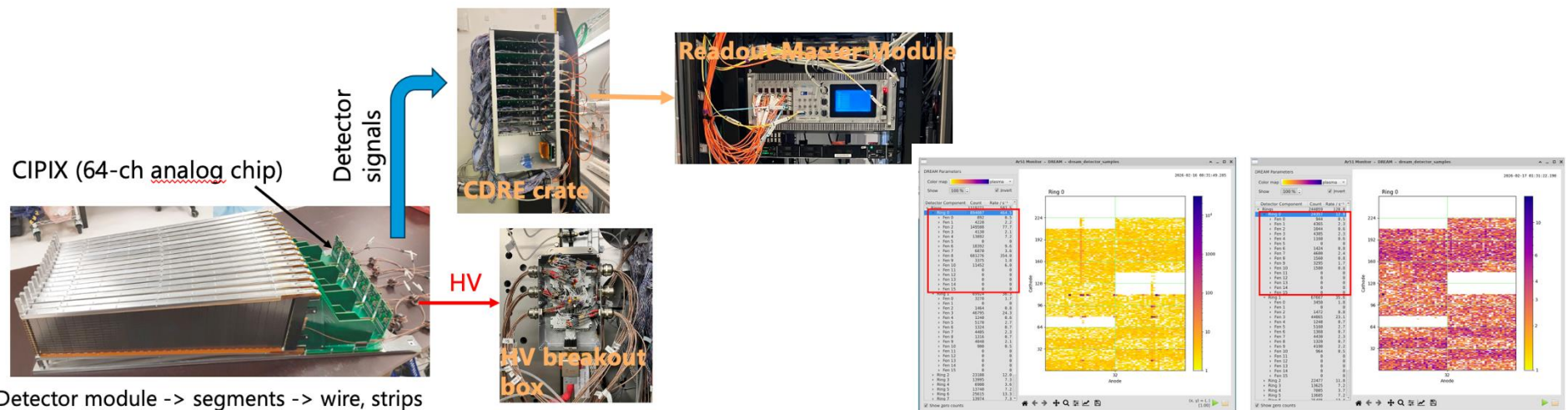
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		<a href="#">NIT-632</a> - CDRE boards are overheating.	Installed active cooling (fans) on the covers of the crates hosting the boards.
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3	<b>Interface for detector control and monitoring (ESS firmware and software)</b>  Failed test 3.7: All 97 FENs are responsive.	<a href="#">NIT-628</a> - Ring bring-up issues.  (The RMM cannot sync with all Front-End readout boards (CDRE) for the detector modules.)	Solved in the later versions of the ESS firmware.
	Failed test 3.9: The EFU receives data in the correct format	<a href="#">NIT-633</a> - Test the RMM with MRF timing (i.e., the global ESS timing system).  The ESS timing is not distributed correctly to the Front-End readout nodes.	NSS-wide issue. The firmware team identified the root cause, and the solution is being worked on.
		<a href="#">NIT-629</a> - Detector data format is not according to the ICD.	Numbering of the detector modules, cathode offset issues. See also NIT-691.
		<a href="#">NIT-691</a> - Firmware delivers data with negative rTOFs	CDT will implement changes in their part of the firmware.
	Passed test 3.3: Deployment on hold due to stability issues observed with the power supply	<a href="#">NIT-626</a> - EPICS integration of the Iseg HV power supply  <a href="#">NIT-677</a> - Iseg HV modules have unstable operation	Testing of the IOC put on hold. The manufacturer of the power supply (Iseg Wiener) was contacted. Instability in operation traced back to a bug in the Iseg firmware.

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## Hot commissioning

DREAM detectors and readout will be ready for HC as soon as the NITs are solved.

Detector group planned activities for hot commissioning:

- Support the instrument team with detector-related activities

Displaced working hours or on-call support: as required.