

Overall description of functional tests for DAS/CCD3 software

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28/8 – 2009, Added dependencies and note fields.
22/9 – 2009, Changes to “Scope”.
12/11 – 2009, Corrections by NOT AiC.
20/4 – 2010, Updates to reflect the current state of development

Purpose

To give an overview of the various software test to be performed in order to verify that the DAS/CCD3 system complies with the requirements as laid out in the document “Data acquisition System, Requirements and development plan” (Reference 1).

The individual test descriptions are given in their own documents.

Scope

The scope of the tests covers the complete Data Acquisition System (DAS). This consists of the CCD3 detector control program, the external FITS information module, the external sequencer commands, the logging through the syslog (sequencer style), the external real time image display and the external detector status display. This system is referred to as the “CCD3/DAS system” from hereon and in the underlying test documents.

Overall test requirements

The DAS/CCD3 shall successfully pass the individual tests described in this document and detailed in the accompanying documents.

Overall test circumstances

The tests shall be performed on a computer similar to the one used for real operation. A test controller with a test CCD camera shall be used for the tests. A network connection to the NOT operational database shall be available for testing the collection of external FITS header information. The physical or geographical location of the performance of the tests is not relevant.

Overall test criteria

The result is acceptable when the DAS/CCD3 software system, in connection with the hardware controller/CCD camera, have successfully passed the tests detailed in the accompanying documents.

Individual tests

The next pages contains the overall description of the individual tests to be performed.

Abbreviations used

ODF-TEST	The document “Overall Description of Functional tests for DAS/CCD3 software” (this document).
ALFOSC/FASU/TCS	Designation of the instrument system status comprised of the instruments ALFOSC and FASU status supplemented with information about the TCS status.
FIES/TCS	Designation of the instrument system status comprised of the instruments FIES status supplemented with information about the TCS status.
STANCAM/TCS	Designation of the instrument system status comprised of the instruments STANCAM status supplemented with information about the TCS status.
NOTCam/TCS	Designation of the instrument system status comprised of the instruments NOTCam status supplemented with information about the TCS status.
MOSCA(FASU/TCS)	Designation of the instrument system status comprised of the instruments MOSCA and FASU status supplemented with information about the TCS status.

References

1. “Data acquisition System, Requirements and Development Plan”, Jacob W. Clasen, Thomas Augusteijn, September 2008.
2. “Current NOT CCD control program and sequencer (external) commands”, Jacob W. Clasen, October 2009.
3. Email from Jeppe to Jacob on 28/5 2009.
4. Email from Jacob to Jeppe on 15/5 2009.
5. “Definition of the Flexible Image Transport System (FITS) (FITS standard version 3.0”, July 10, 2008.
6. “A detailed overview of required FITS header keywords and FITS file structure (version 1.1)”, Jacob W. Clasen, July 14, 2009.
7. “Specification of WCS module for external FITS writer”, Jacob W. Clasen, May 25, 2009.
8. “Direct commands for Copenhagen CCD3 controllers (to be continued)”, Preben Nørregaard, 2009.
9. “List of events produced by the CCD3 program (to be made)”, 2009.
10. Email from Jacob to Jeppe on 28/1 2009.

These documents can be found on the miraculix GroupWare server or on this URL: <http://www.not.iac.es/instruments/development/ccd-controller/index.html>

Test number	1
Test name	File format
Test document	01-test-file-format
Purpose	<p>Verifies that the image file is in MEF format and that the amplifier/image data are written to the correct extension according to</p> <p>1) the “<u>DAS, Requirements and Development plan</u>”, section 1.2</p> <p>and elaborated in</p> <p>2) the document “<u>A detailed overview of required FITS header keywords and FITS file structure</u>”</p> <p>and commented on in</p> <p>3) email from Jacob to Jeppe on 28/1 2009.</p>
Depends on test	<p>2, FITS header (basic by CCD3)</p> <p>3, FITS header (TCS, instrument spec., by external FITS information module)</p> <p>4, FITS header (WCS, by external FITS information module)</p>
Result	<p><input type="checkbox"/> Test PASSED. Tested by _____ on ____ / ____ 20____ Signed _____</p> <p><input type="checkbox"/> Test FAILED. Tested by _____ on ____ / ____ 20____ Signed _____ Cause: _____</p> <p><input type="checkbox"/> Test FAILED. Tested by _____ on ____ / ____ 20____ Signed _____ Cause: _____</p>
Notes	

Test number	2
Test name	FITS header (basic, by CCD3)
Test document	02-test-FITS-HDR-int
Purpose	<p>Verifies that that FITS keywords are present in the image file in the correct extensions and with the correct values as described in</p> <p>1) the “<u>DAS, Requirements and Development plan</u>”, section 3.2</p> <p>and elaborated in</p> <p>2) the document “<u>A detailed overview of required FITS header keywords and FITS file structure</u>” and marked in this document as being collected by CCD3. (Addendum 1., 14/4-2010: with the exception of 'OBJECT', 'OBSERVER', 'IMAGETYP', 'OBS_MODE' and 'IMAGECAT' which will be created and updated via the external FITS information module).</p>
Depends on test	
Result	<input type="checkbox"/> Test PASSED. Tested by _____ on ____ / ____ 20____ Signed _____ <input type="checkbox"/> Test FAILED. Tested by _____ on ____ / ____ 20____ Signed _____ Cause: _____ <input type="checkbox"/> Test FAILED. Tested by _____ on ____ / ____ 20____ Signed _____ Cause: _____
Notes	

Test number	3
Test name	<u>FITS header (TCS, instrument spec., by external FITS information module)</u>
Test document	03-test-FITS-HDR-ext
Purpose	<p>Verifies that that FITS keywords are present in the image file in the correct extensions and with the correct values as described in</p> <p>1) the document "<u>A detailed overview of required FITS header keywords and FITS file structure</u>" and marked in this document as being collected by the external FITS module. (Addendum 1., 20/4-2010: with the exception of 'OBJECT','OBSERVER', 'IMAGETYP', 'OBS_MODE' and 'IMAGECAT' which will be created and updated via the external FITS information module</p>
Depends on test	7, Transmission of CCD3 events (over Ivy bus) (for triggering)
Result	<input type="checkbox"/> Test PASSED. Tested by _____ on ____ / ____ 20____ Signed _____ <input type="checkbox"/> Test FAILED. Tested by _____ on ____ / ____ 20____ Signed _____ Cause: _____ <input type="checkbox"/> Test FAILED. Tested by _____ on ____ / ____ 20____ Signed _____ Cause: _____
Notes	

Test number	4
Test name	FITS header (WCS, by external FITS information module)
Test document	04-test-FITS-HDR-WCS
Purpose	Verifies that that WCS keywords are present in the image file in the correct extensions and with the correct values as described in 1) the document " <u>A detailed overview of required FITS header keywords and FITS file structure</u> ".
Depends on test	7, Transmission of CCD3 events (over Ivy bus) (for triggering)
Result	<input type="checkbox"/> Test PASSED. Tested by _____ on ____ / ____ 20____ Signed _____
	<input type="checkbox"/> Test FAILED. Tested by _____ on ____ / ____ 20____ Signed _____ Cause: _____
	<input type="checkbox"/> Test FAILED. Tested by _____ on ____ / ____ 20____ Signed _____ Cause: _____
Notes	

Test number	5
Test name	CCD3 program functionality
Test document	05-test-CCD3
Purpose	Verifies that all functions needed to control the different types of exposure (dark, bias, focus exposure, science), read out the image, descramble all relevant amplifiers and store the image are present and are working without faults under the circumstances described in the test document.
Depends on test	N/A, Controller hardware tests (outside this scope)
Result	<input type="checkbox"/> Test PASSED. Tested by _____ on ____ / ____ 20____ Signed _____
	<input type="checkbox"/> Test FAILED. Tested by _____ on ____ / ____ 20____ Signed _____ Cause: _____
	<input type="checkbox"/> Test FAILED. Tested by _____ on ____ / ____ 20____ Signed _____ Cause: _____
Notes	

Test number	6
Test name	External command interface (over Ivy bus)
Test document	06-test-cmd-if
Purpose	Verifies that the commands listed in Reference 2. but implemented as sequencer commands can be executed from the UNIX shell and understood by the CCD3 program as if they where given from within the CCD3 program.
Depends on test	
Result	<input type="checkbox"/> Test PASSED. Tested by _____ on ____ / ____ 20____ Signed _____
	<input type="checkbox"/> Test FAILED. Tested by _____ on ____ / ____ 20____ Signed _____ Cause: _____
	<input type="checkbox"/> Test FAILED. Tested by _____ on ____ / ____ 20____ Signed _____ Cause: _____
Notes	

Test number	7
Test name	Transmission of CCD3 events (over Ivy bus)
Test document	07-test-event-if
Purpose	Verifies that the event messages described in the mail from Jeppe to Jacob 28/5 2009 (Reference 3.) are transmitted on the Ivy bus when the corresponding event is taking place. Specifically it is verified that the events needed to trigger (20/4-2010: and synchronize with ccd3comm) the collection of data by the external FITS module and the event needed to trigger the creation of the WCS FITS headers are transmitted at the correct times.
Depends on test	
Result	<input type="checkbox"/> Test PASSED. Tested by _____ on ____ / ____ 20____ Signed _____ <input type="checkbox"/> Test FAILED. Tested by _____ on ____ / ____ 20____ Signed _____ Cause: _____ <input type="checkbox"/> Test FAILED. Tested by _____ on ____ / ____ 20____ Signed _____ Cause: _____
Notes	

Test number	8
Test name	Transmission and storage of CCD3/controller/detector status
Test document	08-test-status-trans
Purpose	Verifies that that the relevant status information listed in the requirements document section 3.4 (see ref. 1) and included in the current database table is updated to reflect the actual state of the elements it is representing.
Depends on test	
Result	<input type="checkbox"/> Test PASSED. Tested by _____ on ____ / ____ 20____ Signed _____
	<input type="checkbox"/> Test FAILED. Tested by _____ on ____ / ____ 20____ Signed _____ Cause: _____
	<input type="checkbox"/> Test FAILED. Tested by _____ on ____ / ____ 20____ Signed _____ Cause: _____
Notes	

Test number	9
Test name	Timing
Test document	09-test-timing
Purpose	Verifies that with a correctly time synchronized (ntp) host computer, the relevant timestamps for different events are within the agreed accuracy. These are events that result in a FITS keyword (DATE-OBS, DATE-AVG, TM_START, TM_END) or in a message transmitted on the message bus.
Depends on test	
Result	<input type="checkbox"/> Test PASSED. Tested by _____ on ____ / ____ 20____ Signed _____
	<input type="checkbox"/> Test FAILED. Tested by _____ on ____ / ____ 20____ Signed _____ Cause: _____
	<input type="checkbox"/> Test FAILED. Tested by _____ on ____ / ____ 20____ Signed _____ Cause: _____
Notes	

Test number	10
Test name	Logging
Test document	10-test-logging
Purpose	<p>Verifies that the CCD3 program logs information according to what is described in</p> <p>1) the “<u>DAS, Requirements and Development plan</u>”, section 3.7 (see ref. 1) and commented on in</p> <p>2) email from Jacob to Jeppe 15/5 2009 (ref. 4).</p>
Depends on test	
Result	<input type="checkbox"/> Test PASSED. Tested by _____ on ____ / ____ 20____ Signed _____ <input type="checkbox"/> Test FAILED. Tested by _____ on ____ / ____ 20____ Signed _____ Cause: _____ <input type="checkbox"/> Test FAILED. Tested by _____ on ____ / ____ 20____ Signed _____ Cause: _____
Notes	

Test number	11
Test name	Status display
Test document	11-test-status-display
Purpose	Verifies that the external status display is receiving the CCD3 status information and presenting it in the defined (TBD) way to the user.
Depends on test	7, Transmission of CCD3 events (over Ivy bus) 8, Transmission of CCD3/controller/detector status (over Ivy bus)
Result	<input type="checkbox"/> Test PASSED. Tested by _____ on ____ / ____ 20____ Signed _____ <input type="checkbox"/> Test FAILED. Tested by _____ on ____ / ____ 20____ Signed _____ Cause: _____ <input type="checkbox"/> Test FAILED. Tested by _____ on ____ / ____ 20____ Signed _____ Cause: _____
Notes	

Test number	12
Test name	External real time image display
Test document	12-test-image-display
Purpose	<p>Verifies that the real time external image display can display images while they are being read out by reading a partially complete image file combined with detector geometry information received via the message bus.</p> <p>(This is not a NOT requirement, but an extra functionality)</p>
Depends on test	<p>7, Transmission of CCD3 events (over Ivy bus)</p> <p>8, Transmission of CCD3/controller/detector status (over Ivy bus)</p>
Result	<p><input type="checkbox"/> Test PASSED. Tested by _____ on ____ / ____ 20____ Signed _____</p> <p><input type="checkbox"/> Test FAILED. Tested by _____ on ____ / ____ 20____ Signed _____ Cause: _____</p> <p><input type="checkbox"/> Test FAILED. Tested by _____ on ____ / ____ 20____ Signed _____ Cause: _____</p>
Notes	