

SW Release Notes

release-2024.2**2024-12-16**



PILATUS4 specific release
WILDHAUS: 2024.2
SIMPLON: 1.8

General:

- First official release supporting PILATUS4 detectors
 - Support for up to 4 thresholds
- Added support for new server type (R260) which replaces the R240

WebUI:

- Changing the application version now also automatically starts the selected version

General fixes:

- Flatfields and pixel masks now properly included in metadata and API request even if *flatfield_correction_applied* is set to *False*
- Initialize is now properly waiting until all underlying components have been initialized as well
- ROI mode for the EIGER X 9M is now working
- Bug reports created using the API now match the bug reports created from the webUI

API changes and fixes:

- System keys can now be requested
 - GET request on <http://<ipaddr>/system/api/1.8.0/keys>
- Changing anything affecting the flatfield should now properly list the flatfield parameter as changed in the returned JSON
- The format key in the filewriter configuration is no longer hidden (bugfix)

release-2024.1.1**2024-08-06**

Bugfix release based on 2024.1
WILDHAUS: 2024.1.1
SIMPLON: 1.8

General:

- Fixed a bug hard locking the EIGER2 XE 16M detectors when running `"check_connection"` command either through the webUI or API.
 - The detector could only be recovered by power cycling it.

Filewriter(1):

- The release of Filewriter2 introduced a bug in Filewriter 1 (`"hdf5 nexus legacy nxmx"`), which now is fixed.
 - `fast_pixel_direction`: The `depends_on` field was pointing to `"."` instead of `"/entry/instrument/detector/transformations/translation"`
 - Filewriter2 (`"hdf5 nexus v2024.2 nxmx"`) is not affected by this change (`depends_on` remains on `"."`)

release-2024.1**2024-03-21**

Generic release
WILDHAUS: 2024.1
SIMPLON: 1.8

General:

- Official release NXmx gold standard for Filewriter
 - NXmx compliant (NeXus v2024.2)
- Added support for new server type (R7615) which replaces R940
- Added SIMPLON API docs at `http://<DCU_IP>/docs/`
- Logs are now deleted if a certain max size (20GB total) is hit instead of using a weekly limit
- Added more debug options in recovery menu
 - `dcu_config` output is now logged after first installation
 - `lspci` added

Fixes

- Fixed the ARINA image orientation which was mirrored by mistake
- Fixed a bug where the webUI would not automatically update anymore during arm

- Fixed a bug where updating *photon_energy* wouldn't return the changed parameters after initialize
- Fixed a bug where parts of the first acquired image could be lost after first initialize
- Monitor *buffer_free* now properly reports available storage
- Minimum *count_time* is now calculated properly in all cases

Filewriter:

- General Filewriter performance improvements
- NXmx gold standard can be enabled using the `../filewriter/config/format` key (see API documentation for details)
 - The official documentation can be found here https://github.com/dectris/documentation/tree/main/filewriter_v2
 - Requires HDF5 Version 1.14 readers
 - Legacy format is set by default when initializing the system

Stream:

- Added *image_dtype* to stream2 (cbor) start message
 - <https://github.com/dectris/documentation/issues/6>

Monitor:

- Added more metadata to tiff files (*detector_distance*, pixel sizes, beam center, *incident_wavelength*)
 - See API docs for details

API

See API documentation for key details.

Please note, the default metadata remains the same when the new keys are unused.

Some keys also affect filewriter(1) metadata!

Filewriter specific

- Added key `../filewriter/config/format`
- Added key `../detector/config/chi_axis`
- Added key `../detector/config/detector_orientation`
 - Affects filewriter1 as well
- Added key `../detector/config/detector_orientation_angle`
- Added key `../detector/config/detector_orientation_axis`
- Added key `../detector/config/detector_translation`
 - Affects filewriter1 as well

- Added key `../detector/config/instrument_name`
- Added key `../detector/config/kappa_axis`
- Added key `../detector/config/omega_axis`
- Added key `../detector/config/phi_axis`
- Added key `../detector/config/sample_name`
- Added key `../detector/config/source_name`
- Added key `../detector/config/total_flux`
- Added key `../detector/config/transformation_order`
- Added key `../detector/config/two_theta_axis`

release-2023.1

2023-05-24



EM specific release
WILDHAUS: 2023.1
SIMPLON: 1.8

General:

- First official release for ARINA detectors
- Update for QUADRO, ELA and SINGLA
- Fixed a bug where the webUI wouldn't update during arm
- Logs now always report the time in UTC
- Fixed a bug where updating the timezone wouldn't affect the meta data (e.g. `start_data`)
- When using difference images in certain conditions the resulting value would be negative. Instead of reporting those as overflow, those pixels are now corrected to 0.
- Fixed a bug where countrate corrected values for `uint4` and `uint12` were not correctly masked as overflow when above the saturation value.
- Fixed a bug where the webUI would show an empty error messages even though there was no error.
- Added an error if an unknown / unsupported API version is used.

API changes (EM detectors):

- New keys for ARINA specific features (see API documentation for details)
 - `pixel_format`
 - `binning_mode`
 - replaces `roi_mode`: `merge2x2`
- Removed following ROI mode

- merge2x2
- Removed threshold keys for certain EM detectors which have locked threshold settings for best possible operation
 - threshold/1/mode
 - threshold/1/energy
 - threshold_energy

Specific Solutions:

- Added support for EIGER2 XE 4M
- Added support for EIGER2 XE 1.5M

release-2022.1.2

2023-01-30



Bugfix Version based on 2022.1.1
WILDHAUS: 2022.1.1
SIMPLON: 1.8

General:

- Fixed bug where pixels were still masked as overflow (0xFF..) when using the mask_to_zero feature instead of "0"
- Added warning that DAQ (app-detector) needs to be restarted after app-calibration has been restarted
- Fixed a bug where less than the maximum possible number of images could be configured for 9M and 16M systems
 - Now 2^{48} total images (ntrigger*nimages) instead of $2 \cdot 10^9$

API:

- Fixed a bug where `trigger_mode` could contain the same entries twice
- Fixed a bug where the minimum `count_time` wasn't set correctly after initialize
- Fixed a bug where the maximum `roi_y_size` wasn't shown correctly when lines ROI is disabled

WebUI:

- Re-added serial number to running calibration app

Filewriter:

- Corrected data size orientation
 - `/entry/instrument/detector/module/data_size` is now [height, width]
- Removed `/entry/sample/transformations/translation` as it couldn't be configured and would bloat the HDF5 master file which could lead to data files being lost.

- Removed dependency to `/sample/transformations/translations` from `../two_theta` parameter

Filewriter2:

- Now using `nxtransformations` instead of `nxgeometry` according to current `Nxmx` definition
- `Total_flux` now in [Hz] according to `Nxmx` definition

release-2022.1.1**2022-11-08**

Bugfix Version based on 2022.1
WILDHAUS: 2022.1.1
SIMPLON: 1.8

General:

- Updated driver to accommodate new system hardware
- `ifconfig` and `ping` now properly work using the `recovery` user

Web UI:

- Fixed a bug where the system serial number wasn't displayed in the UI

Filewriter2:

- Fix `module/data_size` to match `NXmx` dimensions (was reversed before)

Known issues:

- `mask_to_zero` doesn't overwrite "overflow" values to zero even if properly masked, instead the `0xFF` value is retained. Can happen to either noisy or hot pixels.

release-2022.1**2022-09-15**

EIGER2 Feature release
WILDHAUS: 2022.1
SIMPLON: 1.8

General:

- Stream2 release
 - High speed interface enabling multi-threshold readout
 - See also https://github.com/dectris/documentation/tree/main/stream_v2

- 8 bit mode implemented
- System can now be operated in more error conditions (missing module, etc.)
- Added Lines ROI to certain detectors
 - So far only systems which have a height of one module
- Updated Firmware on multiple systems to add new features and stability improvements
- New trigger modes
 - External gating (*extg*) available for all «X» and «XE» systems
 - Externally interrupted exposure series (*eies*)
- EM detector calibration support
- Detector support
 - ARINA
 - variety of new detector models (specific solutions)
 - EIGER1 official support with latest server generation
- Support for new server generation
- Improved Infiniband support in servers
- Updated to latest Fedora OS (36)
- Improved underlying services for app handling
- Improved API performance (faster requests)
- Improved stability during initialize and operation

WebUI:

- Improved Cable Check to include more debug information and be less error prone
- Added Health tab
 - Shows temperature and humidity
 - Included warnings if ignored errors occur to prevent downtime (e.g missing module).
- Added Log tab for easier debugging
- Admin section can be enabled using the 'recovery' user
 - Prevents changes without password on webUI
- Added options to bug report
 - Time frame of logs to be included
 - Include / Exclude sensor logs
- Added hardware configuration information

Debugging:

- Improved logging service
 - Include application versions
 - Error messages
 - Fixed timing related inaccuracies
- Added more functionality to 'recovery' user
 - Ping, tracertr etc.
- Added possibility to get debug images using the API

API - See API documentation for more information

- `roi_y_size` configures now total y – height instead of only half
- `mask_to_zero` enables marking bad pixels (using the `pixel_mask`) as 0 instead of $2^{\text{bit_depth_image}}-1$
- Monitor added `buffer_free` for a better representation of memory usage
- Added `test_image_mode` and `test_image_value` for debug image support.

Bug fixes:

- Monitor buffer could be configured too large and crash the software when using too much memory
- Fixed an issue where special configurations could cause readout errors during long exposures with `auto_summation`
- Changed default values during initialize to prevent «false» initialize errors

Preview:

- SIMPLON v2 preview available
 - Please contact us if you're interested in testing
- Filewriter2 preview available
 - Nxmx gold standard support
 - Multi-threshold support

release-2020.2.6

2022-06



Bugfix Version based on 2020.2.4

General:

- fix cable check -> now returns error on link basis instead of overall error if one link fails
- fix read only file system issue after server restart

Detector specific:

- EIGER1 16M ROI mode fix

Legacy systems

- Support for R930 with Mellanox ConnectX-3

release-2020.2.5

2022-03-22



Bugfix Version based on 2020.2.4

Detector specific:

- EIGER2 R 500K-S/250K: Fix for sporadic issues during initialize

release-2020.2.4

2021-10-29



Bugfix Version based on 2020.2.3.

API:

- SIMPLON trigger does no longer return immediately if `trigger_start_delay` is set
- EIGER2 detector control board flashing fixed
- Stream `series_end` now properly sent when initializing detector during running acquisition
- Stream `dropped` counter now reset again on `arm`
- Filewriter data files again truncated when disarming / aborting / cancelling running acquisition. (old behavior filled data file with FFFF... values until `nimages_per_file` was reached)
- `filewriter/status/files` now properly returns empty list of strings when no files are available instead of `null`
- re-introduced missing API keys `detector_orientation` and `detector_translation` to SIMPLON 1.8

Detector specific:

- EIGER2 XE – fixed a bug where `initialize` could get stuck in an endless failing loop after the first failed `initialize`
- EIGER2 XE 9M fixed bug where detector could not be initialized if only operated with the required 12 data links instead of all 16. It's still recommended to connect all 16 optical fibers to prevent dirt accumulation on the "open"
- Improved stability for EIGER2 R 500K-S during initialize
- Added support for additional EIGER2 geometries

General fixes (all supported product families):

- activate sensor logs even if an error occurs
- log correct hardware configuration version
- *beam_center_x/y* offset now properly calculated when using ROI mode
- detector translation now properly calculated in meters
- wait on user inputs after commands in recovery mode
- *filewriter* now writes data file after final image of said data set (e.g. data_00001.h5) and not on start of next data set
- detector status no longer goes into *error* state when software trigger is sent, but detector is configured for *exts*

Legacy support and fixes:

- Added legacy server support for R820 and R930 with custom NIC (see [legacy server support](#))
- Fixed *cable_check* for EIGER(1) systems
- SIMPLON 1.6 for EIGER(1) fixed visibility of *bit_depth_readout* and *bit_depth_images*
- Fixed module mapping for EIGER(1) detectors
- Fixed EIGER(1) issue which could lead to noise in the image for certain systems
- Network toggling for EIGER(1) now properly shows outputs
- EIGER1 auto_summation – fixed bug which would set auto_summation frequency too low
- EIGER1 Fix count rate correction calculations with auto-summation active

release-2020.2.3**2021-03-01**

Bugfix Version based on 2020.2.2. Will only be used for XE systems!

EIGER2 XE:

- Added new server configuration for XE systems

release-2020.2.2**2021-02-12**

Bugfix Version based on 2020.2.1

EIGER2 R 500K-S:

- Fixed readout issues
- Update to latest firmware version

General:

- Fixed *bit_depth* issue without *auto_summation*. In certain conditions, it is possible to get 32 bit images even when *auto_summation* is off (i.e. *counrate_correction*) but the *bit_depth* value didn't change accordingly.
- In *inte* and *exte* modes, *nimages* can only be set to 1 (required configuration for those modes).
- Add human readable error for trigger series exceeding maximal duration (max. duration 1 week). This is checked during *arm* and returns an appropriate error message.
- Improved logs for debugging
- Support for new hardware
- Don't allow negative TH sensor readings (value is always ≥ 0)

API (1.8.0) additions and fixes:

- Added *unit* to filewriter status *buffer_free*
- Added *allowed_values* to detector status
- Detector status now properly changes to error when detector is no longer powered or connected.
- Fixed issue where *photon_energy* wouldn't always return list of changed values.
- Re-added *detector/status/link_x* for backwards compatibility
- *bit_depth_readout* and *bit_depth_image* read rights are now properly available for EIGER(1) systems (see also "Legacy Server Support")

SIMPLON 1.6.0 changes:



Only active when sending API request with ".../api/1.6.0/..." instead of ".../api/1.8.0/..."

- *monitor_image_number* and *next_image_number* re-added
- Key *error* now visible in *monitor/status/state*

release-2020.2.1

2020-10-23



Bugfix Version based on 2020.2

Additions:

- Added rollback feature for board firmwares

Fixes:

- Increased module flashing wait time
- Return *series end* message when using cancel or abort
- Added *min.* value for *detector_readout_time*
- Fixed counter reset issues with lines ROI
- *nil* value in network configurations no longer breaks communication with detector
- Initialize no longer fails after power cycling detector during operation
- Filewriter now properly calculates total number of images in *inte* and *exte* mode
 - Only *ntrigger* is to be used in those modes. Since total number of images is calculated with *nimages * ntrigger* this could yield too many data files if *nimages* was not set to 1 as required.
- Improved E2 R 500K initialization stability

release-2020.2

2020-09-18

Features:

- CdTe Support
- New high voltage status key available (see SIMPLON API documentation)
- High voltage reset command available (see SIMPLON API documentation)
- Updates and uses latest firmware versions
- Support for XE systems using fiber

Fixes & Changes:

- *detector/state/error* changed back to type *string* instead of *list* to match API 1.8.0 documentation and keep 1.6.0 backwards compatibility. This was an unwanted change and therefore classified as a bug in release-2020.1

- FileWriter and Monitor mode changes (enable / disabled) are only affected while the detector is in the idle stage (after disarm / end of series or before arm)
- Fixed HDF5 data file path if *name_pattern* contains path structure
- Unified “empty” return values (e.g initialize, trigger, hv_reset) to return {} instead of "" and {}. Generally, return values should not be parsed for nonspecific returns.
- Added *incident_energy* to tiff header
- Changing *photon_energy* didn’t return all changed values in return
- Changing *count_time* didn’t return all changed values in return
- Sending trigger before *arm* no longer requires re-initialize
- Corrected reported minimal times in all ROI and full readout modes on *GET* requests
- Countrate correction table didn’t match SIMPLON 1.6.0 implementation (transposed table)
- Missing links now properly reported
- *detector_readout_time* now shows minimal possible value
- Restored *frame_time* and *count_time* interaction of SIMPLON 1.6.0
 - Setting *frame_time* < existing *count_time* now automatically adjusts *count_time* to “*frame_time* - (minus) *detector_readout_time*”
 - Setting *count_time* > existing *frame_time* now automatically adjusts *frame_time* to “*count_time* + (plus) *detector_readout_time*”
- Improved log files for debugging
- Monitor buffer fill behavior changed due to multi-threshold usage. The fill level decreases only after getting all the thresholds of a single exposure.
- Countrate correction cutoff now properly shown for the E2 R 500K-S
- WebUI now shows properly rounded values and updates readings after initialize
- Fixed bug report behavior where download link would be reported before file being available
- Bug report link will now only be returned after the file has been written

API changes:

<u>detector config</u>	
parameter	comment
compression	reordered to match SIMPLON 1.6.0 order ['lz4', 'bslz4', 'none']
element	added key “allowed values”
<u>detector command</u>	
parameter	comment
hv_reset	new key, see SIMPLON API documentation
<u>detector status</u>	

parameter	comment
high_voltage/state	new key, see SIMPLON API documentation
stream config	
parameter	comment
header_detail	reordered to match SIMPLON 1.6.0 order ['none', 'basic', 'all']
filewriter status	
parameter	comment
files	value type changed to string from list
monitor status	
parameter	comment
buffer_fill_level	value_type changed to uint from list

release-2020.1**2020-05-15**

Initial EIGER2 SW release. Previous versions were based on development versions and therefore manifold and without fully structured change management. Please consult the API Reference v1.8.0 for further details about currently available functionality. In case of any compability issues due to API changes please contact support@dectris.com.

Features:

- Use latest firmware versions
- Latest DCUs supported

Fixes:

- Goniometer parameters of *null* won't be written in the metadata. Valid float values (e.g. 0.0) will be written
- Fix *cable_check* and *initialize* in webUI
- Added missing 1.6.0 and 1.7.0 SIMPLON keys for:
 - *monitor/.../images*
 - *system/.../config/*
- Fixed custom flatfield and pixel_mask issue with lines ROI mode
- Fixed meta data issue when using ROI mode
- Improved initialization in case of errors
- Added possibility to disable TH sensor
- System command *restart* now blocking (returns after container has restarted)

Legacy Server Support



Note, this is in an experimental feature for listed EIGER(1) servers. Contact DECTRIS support for additional information.

- DELL PowerEdge R220
- DELL PowerEdge R230
- DELL PowerEdge R820
- DELL PowerEdge R820 – with additional user card (single port) in slot 6
- DELL PowerEdge R930
- DELL PowerEdge R930 – with additional user card (dual port) in slot 3

General Information

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