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## Report

# CODAC Core System Version 6.3 Release Notes

This note is a supplementary document for the CODAC Core System (CCS) to provide users with information on the changes introduced with the release of the CCS 6.3 version

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*Change Log*

**CODAC Core System Version 6.3 Release Notes (4QKMKL)**

<b><i>Version</i></b>	<b><i>Latest Status</i></b>	<b><i>Issue Date</i></b>	<b><i>Description of Change</i></b>
v0.0	In Work	25 Feb 2021	
v1.0	Approved	26 Feb 2021	Initial version (public draft) for 6.3.0
v1.1	Approved	10 Mar 2021	All known document updates and all reviewers comments taken on board.
v1.2	Approved	11 Mar 2021	Update, taking on board the Data Visualization Tool manual and updated versions of the Installation Guide and this document.
v1.3	Signed	20 Sep 2021	Updates for CCS maintenance release 6.3.1
v1.4	Approved	21 Sep 2021	- Update documentation table with new version numbers - Add bullets about installation procedure improvements

## CODAC CORE SYSTEM VERSION 6.3 RELEASE NOTES

### [ITER\\_D\\_4QKMKL](#)

This note is a supplementary document for the CODAC Core System (CCS) to provide users with information on the changes introduced with the release of the CCS 6.3.0 version and those added with the CCS 6.3.1 maintenance version.

Additions for CCS 6.3.1 are kept in separate, clearly marked paragraphs; new version numbers in tables are underlined or in **bold** typeface.

See **warnings** in these notes for changes that may have a significant impact on existing I&C applications. Those that are present since previous versions are indicated with a **reminder**.

This document is complemented with on-line information that is available at the [CODAC Core System Community Pages](#) that provides the CCS users with the up-to-date status of:

- The [documentation](#)
- The [changes](#) introduced in each components (improvements and bug fixes)
- The [known issues](#) in the 6.3.1 version
- The [roadmap](#)
- The [training](#) material, which will be updated for CCS 6.3.1 hands-on workshops.

The **CS-Studio Release Notes** are in a separate document: [CODAC Core System Version 6.3 CS-Studio Release Notes \(4G97YB\)](#).

**Warning** I&C projects developed with a previous versions of CCS shall be migrated following the instructions available in the [CODAC Core System Migration Guide \(7JCFUD\)](#).

### **Main changes in CCS 6.3.0**

1. The Eclipse framework has been updated to version 4.16.
2. The OPC UA Device Support has been updated to version 0.8.0 (version 0.9.2 in 6.3.1).
3. A Shift Service has been introduced into the Logbook extensions of CS-Studio.

**Warning** In the 6.3.0 release, the SDD integration of PLCs through the OPC UA Device Support still has some issues. When using this setup, please contact [CODAC-Support](#) for updates and/or patches.

In CCS 6.3.1, the OPC UA Device Support has been updated to version 0.9.2 and the known SDD integration issues related to PLC integration have been resolved.

## COMPONENTS UPDATE

	Components	6.0	6.1	6.2	6.3.0	6.3.1
<b><u>Operating System</u></b>	RHEL	<b>7.4</b>	7.4	7.4	7.4	
<b><u>EPICS</u></b>	EPICS Base	7.0.1	<b>7.0.2</b>	<b>7.0.3.1</b>	<b>7.0.4.1</b>	
	EPICS Base Java				<b>7.0.6</b>	
<b><u>Shared Units</u></b>	Java	1.8.0	1.8.0	<b>11.0.3</b>	11.0.3	
	Eclipse	4.6.3	<b>4.7.3</b>	<b>4.11.0</b>	<b>4.16.0</b>	
	PostgreSQL	9.6.2	<b>10.5</b>	10.5	10.5	
	Tomcat	8.5.13	8.5.13	8.5.13	8.5.13	
	Firefox	<b>52.3.0</b>	52.3.0	52.3.0	52.3.0	
<b><u>Control System Studio</u></b>	CS-Studio	4.5.2	<b>4.6.202</b>	<u>4.6.310</u>	<b>4.7.8</b>	<u>4.7.802</u>
<b><u>Self Description Data</u></b>	SDD tools	<b>6.0</b>	<b>6.1.2</b>	<b>6.2.1</b>	<b>6.3.0</b>	<u>6.3.1</u>
<b><u>Maven Tools</u></b>	Maven tools	<b>6.0</b>	<b>6.1.2</b>	<b>6.2.0</b>	<u>6.2.1</u>	
<b><u>Health Monitoring</u></b>	Health Mon	1.7	<b>2.0</b>	2.0.1	2.0.1	
<b><u>PLC Driver</u></b>	S7PLC ASYN	1.5	<b>1.6</b>	<u>1.6.1</u>	1.6.1	<u>1.6.2</u>
	SPSS (300/1500)	3.4/1.0	<b>3.5/1.1</b>	<b>3.6/1.1</b>	3.6/1.1	
<b><u>TCN Support</u></b>	TCN API	3.3.0	<u>3.3.1</u>	<u>3.3.2</u>	3.3.2	
	TCNd	5.2.0	<u>5.2.3</u>	5.2.3	5.2.3	
	Unified PTPd	1.1	<b>1.2.1</b>	1.2.1	1.2.1	
<b><u>SDN Support</u></b>	SDN API <sup>1</sup>	2.2.0	2.2.0	2.2.0	2.2.0	
	SDN Archiver	1.1.0	<b>1.2.0</b>	<u>1.2.1</u>	1.2.1	
<b><u>DAN Support</u></b>	DAN API	<b>3.1.0</b>	<b>3.2.1</b>	<u>3.2.3</u>	<u>3.2.4</u>	
<b><u>Logging Library</u></b>	LOG API	1.3.4	<u>1.3.7</u>	1.3.7	1.3.7	
<b><u>NI Sync</u></b>	NI SYNC	2.2.0	<u>2.2.1</u>	2.2.1	2.2.1	
	NI SYNC EPICS	2.1.2	2.1.2	2.1.2	2.1.2	
<b><u>PXI-6259</u></b>	PXI-6259	2.5.1	<u>2.5.3</u>	2.5.3	2.5.3	
	PXI-6259 EPICS	2.6.1	2.6.1	<u>2.6.2</u>	2.6.2	<u>2.6.3</u>
<b><u>PXI-6528</u></b>	PXI-6528	1.3.1	1.3.1	<u>1.3.2</u>	1.3.2	
	PXI-6528 EPICS	1.3.4	1.3.4	1.3.4	1.3.4	
<b><u>PXIE-6368 / PXIE-6363</u></b>	PXIE-6368	3.0.0	3.0.0	<u>3.0.1</u>	3.0.1	
	PXIE-6368 EPICS	1.5.0	<b>1.6.1</b>	1.6.1	<u>1.6.2</u>	
<b><u>NI RIO</u></b>	NI RIO	2.1.0	<u>2.1.1</u>	2.1.1	2.1.1	
	IRIO EPICS	1.1.2	1.1.2	1.1.2	1.1.2	
<b><u>OPC UA</u></b>	OPC UA Support	p0.9.2	<b>0.5.1</b>	<u>0.5.2</u>	<b>0.8.0</b>	<b>0.9.2</b>
	OPC UA library	1.5.5	1.5.5	1.5.5	1.5.5	

**Legend**     **Bold:** new version (major/minor) – Underlined: new version (bugfix)

**Reminder**     From version 6.0, NDS has been removed from the CCS distribution and is being distributed separately.

<sup>1</sup> Although still used by the SDD generated programs, the templated SDN API will eventually become deprecated in favour of the SDN Core library. For all new developments, it is recommended to use the SDN Core library.

# 1 Operating System

The RHEL version is RHEL 7.4.

The kernel version is 3.10.0-693:

- 3.10.0-693.2.1 for the default installation
- 3.10.0-693.rt56.617 for the RT enhanced one (MRG-R).

Changes:

- (8858) Unification of CCS service tools logging. All operations which make changes to the system (register, unregister, install, uninstall, update, version switch/activate, change root password, change hostname, switch kernel), regardless of the tool, are now being logged to `/var/log/codac-installation.log` with the following syntax:

```
[<timestamp>] [<user>@<host>] [<tool>:<pid>] [] [<severity>]:
<module>.<function>: <message>
```

**Reminder** Since CCS 6.0.0:

- The NTP service daemon `ntpd` has been replaced by `chronyd`;
- The System V / BSD init system, `initd`, has been replaced with `systemd` for services management;
- The linker became stricter with respect to external library references (see Migration Manual for details).

Changes for 6.3.1 (these changes specifically affect CCSv6.3.1):

- (13806) Added support for reading `codac-network` configuration from configuration files rather than querying it from already configured network interfaces.
- (10055) Fixed broken `codac-configure` snippet for configuring TCN interface (`codac-configure tcn_interface <dev>`).

Changes for 6.3.1 (these changes have effect on all CCS versions based on RHEL 7):

- (13681) A new tool called `codac-subscription-manager` to manage Satellite Server 6 subscriptions was added to the CODAC Installation Toolkit. In particular, it allows listing and deleting subscriptions. Examples of use:

```
Check registered systems:
$ codac-subscription-manager -u <Satellite server username> -l

Unregister specific systems:
$ codac-subscription-manager -u <Satellite server username> -d
<system name>

Show help:
$ codac-subscription-manager -h
```

- (13790) CCS installation procedures now support UEFI based systems (requires a dedicated installation ISO image<sup>2</sup>).

<sup>2</sup> See <https://sharepoint.iter.org/departments/CHD/CODAC/Community/SitePages/Installation.aspx>

- (13901) Made debug symbols for the CODAC v6 standard kernel version available for installation from CODAC repositories (`yum install kernel-debuginfo` when subscribed to Satellite server).

A number of issues were fixed in the installation toolkit; be sure to update to the latest version using `codac-update -t` command.

## 2 EPICS

EPICS 7 is included in the CCS 6.x distributions. It comprises the modules previously versioned as EPICS Base 3.x.x (3.15.5 in CCS 5.4.0) and the pvData/pvAccess modules (aka EPICS V4).

The details for all the EPICS components included in the CCS 6.3 distribution are available in the CCS 6.x EPICS Roadmap: [EPICS Related Roadmap for CCS 6.x \(UL8KVQ\)](#)

The versions included in this release are the following – no changes for CCS version 6.3.1:

Module	6.3.0
EPICS 7 C++	7.0.4.1
EPICS 7 Java	7.0.6
areaDetector <sup>3</sup>	Core: 3.10 SimDetector: 2.10
ASYN	4.41
Autosave	5.10
Busy <sup>3</sup>	1.7.2
CA Gateway <sup>3</sup>	2.1.2
Calc	3.7.3
CaSnooper	2.1.2.3
JCA	2.4.4
Multi-Core Utilities	1.2.2
PCAS	4.13.2
pvaPy	3.0.0
PyEpics	3.4.2
Sequencer	2.2.8
Std	3.6.2
StreamDevice	2.8.16
VisualDCT	2.8.2

## 3 Shared Units

Changes:

- (12649) Eclipse 2020-06 (4.16);
- (13014) Doxygen 1.8.20 (under the name `doxygen1820`). The older 1.8.5 version stays default.

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<sup>3</sup> The RPMs are not installed as part of a CCS system profile. They shall be installed as required, see the CCS 6.x EPICS Roadmap for details.

## 4 Control System Studio (CS-Studio)

Enhancements:

- Integration of CS-Studio 4.7. This version is based on Eclipse 2020-06 (4.16) with Tycho 2.0, Batik 1.11, PyDev 7.7.0 (2020-08-02), PostgreSQL JDBC driver 42.2.14, EPICS JCA 2.4.3 and ELK stack 7.8.1.
- Logbook Extensions:
  - A rich text toolbar has been added in the logbook entry description field that allows the operator to add tables, bulleted and numbered lists, to align and format the entry text in bold, italic, and to select the font and background colour.
  - A Shift service has been introduced and customised. It allows to start/end a shift, assign a logbook entry to a shift, and search shift entries. It is possible to use the logbook Python API to extract shift entries for a given period and produce a report.
  - A new Shift Table lists the shift activities and provides shortcuts to start / end a shift and to search for shift entries.
  - The Log Tree lists the result of a shift entries search.
  - A new Template service has been developed. It allows to make a snapshot of a set of process variables and add it automatically to an entry, assign a shift, logbooks, tags and entry level, prefill the entry text and ask the operator for additional information. A wizard helps to define and import logbook templates.
  - The logged user who is creating the logbook entry is registered as the owner (author) of the entry and no more as anonymous.
  - The logbook online help has been updated accordingly.
- Alarm System (BEAST) Optimisation:
  - A new index has been introduced in the message history (LOG) database schema to improve the search query.
  - Loading the alarm tree based on the alarm configuration has been optimised as well as retrieving the message history content.
- PON Archiving System (BEAUTY) Improvement:
  - The new setup of the data browser allows an automatic history refresh, i.e., when the live data ring buffer has less than 15% of capacity left, archived data will be fetched automatically from the database. This way, it is no more required to size the live data buffer for each trace according to the PV update rate.
  - A retry mechanism has been implemented for getting archived samples from the database, particularly useful when the query is cancelled due to conflict with recovery on PostgreSQL replica/standby server.
- Operator Interface Enhancement:
  - Action buttons support now icons in SVG format.
- Other Improvements:
  - Only PV Write log messages and alarm change messages are recorded in the LOG database - any other messages, including exceptions are filtered out.
  - CS-Studio E-Mail support library has been extended to send any attachment file types and not only image files. This will allow the exchange of plot files (.plt) as well as logbook entries export files in csv and pdf format.
  - WebOPI concurrent sessions have been optimised and a specific tomcat-css configuration has been tested that allows until 100 parallel user sessions (WebOPI Performance Assessment --> 100 parallel user sessions ([47CZHG](#))).

## Main bug fixes:

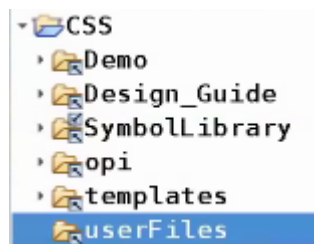
- Some context menus (Create Log Entry, Process Variable...) were missing from the Alarm Pane - they have been reintroduced.
- Multiple issues were reported on the Alarm Tree: it was not refreshed when the alarm model was updated, the widget was empty when the root was an alarm PV (alarm page use case) or was triggering an exception when the alarm root was null and the presence of a reduced context menu on the ITER composite level. They all have been fixed.
- Autocomplete result overwrite issue has been solved.
- Logbook create entry focus was lost after adding a screenshot - it has been fixed.
- From running OPI, sending email failed without error message: it has been fixed.
- PV Fields Viewer exception when pressing ENTER in the PV Name empty entry text, is now trapped correctly.
- CS-Studio lclipse text editor does not show the funding dialog anymore.

The details are provided in dedicated release notes: [CODAC Core System Version 6.3 CS-Studio Release Notes \(4G97YB\)](#).

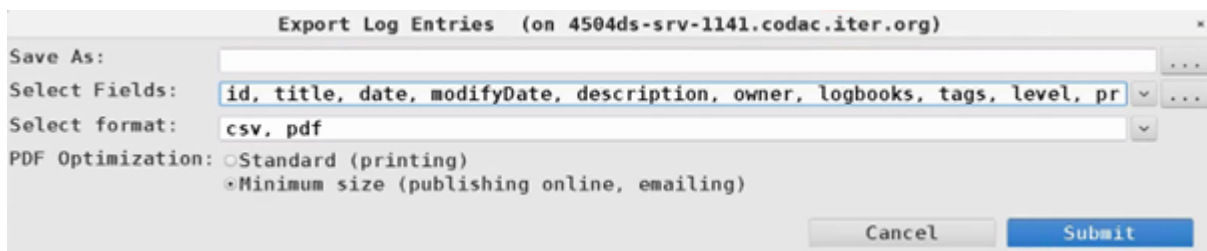
## Changes for 6.3.1

## Enhancements:

- (13777) New linked folder in CSS to `~/.css_user_files` that can be used to store more permanent files like plot definition and exported data



- (13652) Logbook entries PDF Optimization export new options specifically designed for screenshots:



- (13636) Logbook table default expanded format on multiple lines
- (13670) jms-send utility new option `-mode NORMAL|MAINTENANCE` to switch on and off an alarm server maintenance mode
- (13680) With the new option `-mode NORMAL|MAINTENANCE` an alarm server can be started in a given mode (by default `NORMAL`)

## Bug fixes:

- (13577) Infinite loop when parsing OPI macros fix
- (13381) Logbook table refresh issue fix when the operator reply to an entry
- (13652) Logbook entries with special characters export format issue



TCR context fixes:

- (13566) codac-configure shift and template services configuration fix
- (13720) jms-send utility makes use of CS-Studio default configuration file like the JMS URL
- (13684) Logbook services missing dependencies
- (13390) Entry and shift template wizards robustness fixes
- (13577) WebOPI navigation contextual menu fix
- (13580) WebOPI XY Graph widget integration fix
- (13575) ELK rotate and delete Logstash and Elasticsearch log files setup

## 5 Self Description Data Tools

Main enhancements:

- (12419) The option to generate one IOC per PLC was changed to become an I&C project option instead of SDD Editor application option. This way, this important generation choice will be remembered across different CODAC installations. Projects relying on this feature would need to set this setting once in the project properties;
- (10246, 12815) It is now possible to deploy PLC variables on IOC other than the default `PLC` IOC. This could be useful when the default allocation is not suitable for some reason. Similar arrangement is now allowed on POC-without-CA;
- (12727) IOCs will now always be generated if they are declared in the project. Previously, a declared IOC could have been omitted from generation if it had no variables to serve;
- (12732) System templates, in addition to specifying the control unit to deploy a variable on, will now also let user designating a specific IOC to use, with the help of the `IOC` macro;
- (12414, 12774) It is now possible to batch-update IOC and I/O module properties of PON variables;
- (12061) Additional macros required to support PLC simulation feature (EPICS record `SIMPL` field) will now be prefilled. Variables need to define a deployment unit for this to work. Previously, these additional macros had to be provided by user;
- (12529) SDD variable description and EPICS `DESC` field are now tightly linked, so editing one would update another;
- (12000) PLC datablock version, assigned automatically by SDD, can now be edited in SDD Editor. This could be useful for integration with external tools generating PLC code. Unless you need this functionality, it is recommended not to alter the automatic version in order to avoid PLC communication problems;
- (12009) It is now possible to have PLCs working via “s7plc-asyn” and OPC UA drivers to be configured in the same I&C project. In addition to project-wide preference, device support can now be configured on per-PLC level. Previously, only one type of connection could have been selected per project;
- (12109) OPC UA support was improved to provide variable linking to OPC UA sessions, subscriptions and structures (`opcuaItem`). This information is now used to pre-fill record `INP/OUT` fields. Previously, these fields had to be manually provided by user;
- (12663) For OPC UA EPICS records, field `DTYP` and `SCAN` are now prefilled in the SDD Editor and are available for modification by expert user. Previously, these fields were handled exclusively by SDD Translator with no control over their content;

- (11078) “mutability” support has been extended to system monitoring templates. In practice this means that thresholds for “sysmon” alarms could now be modified on a per-controller basis. Note that it requires that select fields are marked as “mutable” in the “sysmon” template – something not yet done in CCS 6.3;
- (12896) Improved diagnostic on Excel import of SYSM variables. It is not yet possible to modify such variables via Excel import, but there was no warning or record in the log thrown if such attempt would be made. Now rejected modifications to SYSM variables will be flagged in the import log;
- (11581) It is now possible to explicitly declare interfaces of I&C programs (PON, SDN or DAN interface). If the interface is unchecked, the corresponding API support will not be generated. For compatibility reasons, previously created programs will have all interfaces enabled;
- (7403) I&C programs created by SDD Editor are de-facto C++ programs, so C/C++ selector which had had no practical effect was removed from program properties;
- (12007) SDN header generation was enhanced to provide an additional `#define` which contains class structure encoded in XML format. This could be used when working with generic SDN API;
- (12610) When creating a new I/O module, its number will now be automatically prefilled. Previously, providing its value was left to the user, and the module could not be saved if no value was given;
- (12680) BEAST XML schema, `/opt/codac/schemas/xsd/csstudio-beast/AlarmConfigurationSchema.xsd`, was updated to match with the latest BEAST design. It can be used to validate BEAST configuration files prior to loading them. As the new schema is more stringent, SDD templates including non-conformant BEAST attributes might fail to load and would need manual correction;
- (12511) Variable import from Wizard will now look by default for `.xlsx` files. Loading `.xls` files remains possible;
- (11139) Simple commands can now be deleted using `Delete` key, like any other variables. Previously, this action had no effect;
- (12385) `sdd.xml` generation in I&C project was switched to `sdd-sync-direct` tool, which will result in 10-100 times faster execution. The classical `sdd-sync` is retained and can be used for projects not relying on 6.3-specific features;
- (13212) Improved SDD Editor performance when opening CBS functions with many variables;
- (12700, 13257) `sdd-sync-direct` (high performance `sdd-sync`) release v0.15. See changelog in `/opt/codac/sdd/sdd-sync-direct/doc/changelog.txt`.

About 50 bugs were fixed; notable bug fixes include:

- (12624) For POC-without-CA, if variables from the same CBS are allocated on different IOCs, they will now be correctly split into several `.db` files;
- (13300) Fixed DAN source channel number generation of DAN configuration, which did not match the information presented in SDD Editor;
- (13338) Fixed missing driver configuration for projects using PXIe-6363 boards;
- (13012, 13327) Fixed invalid or missing allocation of “sysmon”/“iocmon” templates in certain scenarios;
- (13104) Fixed missing `calc.mk` snippet when using `scalcout` record type;
- (13032) Restored generation of PLC data block version in format `YYYY-MM-DD HH:MM:SS`. In CCS 6.2 it was inadvertently changed to `DD-MM-YYYY HH:MM:SS` due to changes in underlying Java treatment of timestamps;

- (12738) Fixed significant delay when EPICS Details tab is clicked in I&C navigator of template variables;
- (12489) Fixed some missing hardware models of fast controllers.

Notable remaining issues are listed below. If you run into one of these, please contact CODAC support:

- (12993) Cubicle monitoring functionality may not be fully operational, especially when loading older projects;
- (12720, 13408, 13412, 13421, 13423) OPC UA support in SDD remains experimental and has many small glitches;
- (13040) Switch back from CCS 6.3 to 6.2 may break SDD database connectivity (projects are not lost);
- (12928) migration of “sysmon” functionality for fast controllers is missing;
- (10469) SDD may impose an unnecessary increase in user template versions.

Changes for 6.3.1:

- (13005) A new macro `WIDGET_TYPE` is now supported for system templates. It allows using the same template with different device widgets sharing the same control logic. The macro is typically used as part of `Boy Template Location` setting of the template.
- (13411, 13875) A number of changes was made to adapt to the latest OPC UA EPICS device support v0.9 shipped with this release;
- (13812) Fixed accumulation of OPC UA configuration in generated files every time the configuration gets changed;
- (13556) Fixed unexpanded macros appearing in SDD-generated OPI files of OPC UA projects;
- (13412) Incorrect `SCAN="I/O Intr"` for OPC UA output records was changed to `Passive`. Equally, `SIML` field pointing to a variable which had not been implemented in OPC UA case was suppressed;
- (13408) Fixed incorrect generation of `s7plc-asyn` SYSM variables when OPC UA device support is in use;
- (13410) OPC UA `batch-nodes` option (also called `nodes-max` in this release) allowed for an empty value in SDD Editor, which was causing an error at run-time. The empty value will no longer be allowed;
- (13423) Fixed treatment of device support setting on PLC level. Previously it was ignored, and only project-wide setting was taken into account;
- (13422) Altering PLC device support setting will now ensure that automatically deployed templates match the new setting;
- (13421) Creation of “PLC events” will now respect per-PLC device support setting. In OPC UA case where there is no matching concept, creation of PLC events will be disallowed;
- (13902) Fixed missing INP/OUT fields in PLC variables originating from user templates;
- (13824) Fixed the need to fill offsets for PLC simple commands (side effect of template handling refactoring);
- (13735) Fixed missing generation of cubicle monitoring PVs in projects with cubicles;

**Warning** The cubicle monitoring template is automatically instantiated in SDD when you create a cubicle or a cubicle monitoring PLC. No migration action is executed between 6.3.0 and 6.3.1. If you load a 6.3.0 project where this instantiation was not working, you need to recreate one of these items to have the PVs.

- (13494) Fixed errors when renaming PVs which is referred to from other PVs;
- (13495) Fixed an error when renaming a simple command;
- (13274) Fixed exception when deleting user-defined attributes of a variable;
- (13812) Fixed performance issue when validating a project having PSOS defined;
- (10469) Significantly reduced probability of unintentional user or system template version increase when importing a project;
- (13547) Fixed incorrect values of macros in Excel export of variables originating from templates;
- (13466) Import of Excel with differences between variable descriptions and EPICS `DESC` field will now generate warnings. Previously, different values were silently accepted. As a reminder, from 6.3.0 manipulating any of these properties in SDD Editor updates its counterpart automatically;
- (13400) Fixed exception when import of `sdd.xml` fails. Now a proper error message will be shown;
- (13689) Fixed incorrect diagnostic when `sdd.xml` exported on 6.3.0 could not be imported back on another 6.3.0 machine (usually, due to missing project-specific static data). Previously, a misleading format error message was reported;
- (13438, 13737) Fixed incorrect import of `sdd.xml` containing DAN variables bound to I/O boards. The import was successful but the resulting project could not be used for file generation;
- (12928) Fixed migration of `sdd.xml` containing POC-without-CA controllers. Previously, such a project might have had failed import;
- (13255) Fixed migration of `sdd.xml` containing CODAC servers. Previously, the project could not be imported because of incorrect attempt to inject SYSM variables;
- (13723) Fixed `sdd.xml` export import in projects using macros both on the level of variables and variable attributes. Previously, a corrupted project was exported which could not be imported back;
- (13736) Fixed `sdd-sync` interoperability issue, where some projects imported with `sdd-sync-classic` could not be deleted or overwritten with `sdd-sync-direct`.

Versions of SDD reference data in this release:

- PBS snapshot version 20210125;
- CBS snapshot version 20210125;
- GBS snapshot version 20190204 (no changes);
- TTT snapshot version 20210125;
- AAAA snapshot version 20160613 (no changes);
- SS snapshot version 20140129 (no changes);
- Units of measure snapshot version 20180130 (no changes);
- Equipment catalog snapshot version 20190205 (no changes), including:
  - ITER slow controller catalog 333J63 v4.1 (11 Aug 2017);
  - ITER fast controller catalog 345X28 v2.7 (19 Dec 2018).

**Reminder** The SDD web application has been removed from the CCS distribution since version 6.0.0. Use the SDD Editor for local development. The central web application can be consulted at <https://sdd.iter.org>.

## 6 Maven Tools

Changes:

- (12642, 12761, 12769) `mvn sonar` now fully supports multi-module packages. Previously, these project would report no statistics on Sonar server;
- (12627) `mvn` now seamlessly supports Valgrind execution. Valgrind is a popular memory issues checker, available by default with CODAC Core System. New parameter `mvn test -Dvalgrind` will run test suite under Valgrind governance. `mvn sonar`, in its turn, will include Valgring reports to a Sonar server submission. The feature can be controlled with `valgrind.enable` pom.xml setting;

## 7 Health Monitoring

Changes:

- Module versions: Cubicle monitoring 2.0.0, ioc monitoring 1.8.0, sysmon 2.0.1, CFA633 monitoring 1.1.0, PICMG monitoring version 1.1.0
- (12487) TCN related monitoring PVs aren't working – fixed.

**Reminder** With CCS release 6.1.0, the health monitoring PV name convention has changed. The names of the PVs linked with components are now built from the component name instead of a component type and index.

For a component named  $\$(PPPPPP)-\$(TTT)-\$(NNNN)$ , the PV are named as:  $\$(CBS)-\$(SYSM)-\$(PPPP)-\$(PP):\$(TTT)\$(NNNN)-[CCCC]-VAR$  instead of:  $\$(CBS)-\$(SYSM):\$(X)\$(nnn)[CCCC]-VAR$

## 8 PLC Driver

SPSS versions:

- SPSS v3.6 for S7-300/400
- SPSS v3.5 for S7-400H
- SPSS v1.1 for S7-1500

Changes for 6.3.1:

- (13774) The `spss-monitor` command line tool (that had been removed for 6.3.0) has been resurrected.

## 9 TCN/PTP Support

Changes:

- (13189) Fixed PTPd control/monitor interface bug in CCS 6.1 and 6.2, also responsible for deteriorated TCNd performance.

**Reminder** The support for the legacy NI PXI 6682 board is stopped since CCS 6.0 and the `ptpd-nisync` daemon has been removed from the distribution.

## 10 SDN Support

Changes:

- (13471) SDN archiver: Support for nested structures.

**Reminder** Interoperability across little/big endian platforms introduced in 6.0.0 with some limitations.

Check [CODAC Core System Version 6.0 Release Notes \(VQYPWG\)](#) for details.

## 11 DAN/UDA Support

New features / changes:

- (12861, 13052) DAN: Support for affinity configuration on archive side and basic compression if data rate is low ( $\leq 100$ MB/sec).
- (13055, 13472) UDA: Support for new syntax for pulse identifiers (LOCATION:CATEGORY/<pulse number), support for Python 3.8, support for nested structure viewer and query (either full sample or a particular node leaf).
- (13416) UDA: New data vis tool to view and analyze time traces.
- Changes for 6.3.1:
- (13598) DAN: Fix bug that had user metadata of a pre-6.3 program not being archived under 6.3.
- (13613) DAN: Fix bug that had DAN not accept multiple streamers that were fully specified.
- (13718) DAN: Provide an API that allows polynomial calibration settings for a channel.
- (13863) UDA: Changed the plugin version to match the project version to allow client code for easier feature checks.
- (13868) UDA: Fix bug that had UDA return junk data for a non-existing pulse number.
- (13810) UDA: Fix a bug that had uda-write-pulse-test not set the description.

## 12 Logging Library

No changes.

## 13 NI Sync

No changes.

## 14 PXI-6259

Changes for 6.3.1:

- (13522) A bug has been fixed that led to the input channel mapping of a PXI-6259 board periodically changing during long-term acquisitions.

## 15 PXI-6528

No changes.

## 16 PXIe-6368 / PXIe-6363 (X-Series)

No changes

## 17 NI RIO

No changes.

## 18 OPC UA

Changes:

- Support writing of user-defined structures ([#52](#))
- Improved error/status handling ([#42](#))
- Improve handling of single-item read and write operations ([#51](#), [#66](#))
- Add configurable namespace index number mapping ([#68](#))
- Add configurable BINI reconnection behavior ([#62](#))

Changes for 6.3.1:

- Timestamps of EPICS records can be read from data structures coming in over OPC UA.
- A new write-on-change mode allows automatically writing a user-defined structure when any element of the structure has been updated on the IOC.
- The available commands on the IOC shell have been improved and simplified.
- OPC UA Security features are fully supported.

**Warning** In 6.3.1, any OPC UA session that is intended to run without OPC UA Security must have the option “sec-mode=None” explicitly set.

**Reminder** Since CCS 6.1, the prototype OPC UA support component has been replaced with the final implementation. While the features are more or less the same as using the prototype, the API (Makefile support, format of database links and commands in startup script) has changed. The SDD integration creates projects for the new support; using the prototype is not recommended.

## 19 Other Components

The unmaintained prototype implementations of CVVF, SUP and PSPS were removed.

## DOCUMENTATION UPDATES

Document	ID	6.0	6.1	6.2	6.3.0	6.3.1
CODAC Core System v6.3 Release Notes (this doc)	<a href="#">4QKMKL</a>				<a href="#">v1.2</a>	<a href="#">v1.4</a>
<b>OVERVIEW</b>						
CODAC Core System Overview	<a href="#">34SDZ5</a>	<a href="#">v6.1</a>	<a href="#">v6.2</a>	<a href="#">v6.2</a>	<a href="#">v6.3</a>	
CODAC Core System User Manual	<a href="#">43PSH9</a>	<a href="#">v3.10</a>	<a href="#">v3.11</a>	<a href="#">v3.12</a>	<a href="#">v3.13</a>	
<b>INSTALLATION &amp; SUPPORT</b>						
CODAC Core System Installation Manual	<a href="#">33JNKW</a>	<a href="#">v6.0</a>	<a href="#">v6.0</a>	<a href="#">v6.1</a>	<a href="#">v6.3</a>	<a href="#">v6.5</a>
CODAC Core System Migration Guide	<a href="#">7JCFUD</a>	<a href="#">v5.7</a>	<a href="#">v5.8</a>	<a href="#">v5.9</a>	<a href="#">v5.10</a>	
<b>DEVELOPMENT &amp; TESTING</b>						
CODAC Core System App Development Manual	<a href="#">33T8LW</a>	<a href="#">v5.5</a>	<a href="#">v5.6</a>	<a href="#">v5.7</a>	<a href="#">v5.8</a>	
SDD Editor User Manual	<a href="#">32Z4W2</a>	<a href="#">v8.7</a>	<a href="#">v8.8</a>	<a href="#">v9.0</a>	<a href="#">v9.1</a>	
SDD Synchronization Guide	<a href="#">46AAXR</a>	<a href="#">v1.18</a>	<a href="#">v1.18</a>	-	-	
How to include a new I/O module in SDD	<a href="#">A4WQDZ</a>	<a href="#">v2.0</a>	<a href="#">v2.0</a>	<a href="#">v2.0</a>	<a href="#">v2.0</a>	
Maven Editor User Guide	<a href="#">7MT2YC</a>	<a href="#">v5.8</a>	<a href="#">v5.9</a>	<a href="#">v5.10</a>	<a href="#">v5.11</a>	
System Health Monitoring Variables	<a href="#">35XFCY</a>	<a href="#">v1.19</a>	<a href="#">v2.0</a>	<a href="#">v2.0</a>	<a href="#">v2.0</a>	
Logging library - Software User Manual	<a href="#">QEK784</a>	<a href="#">v1.5</a>	<a href="#">v1.5</a>	<a href="#">v1.5</a>	<a href="#">v1.5</a>	
<b>CONTROL SYSTEM STUDIO</b>						
CODAC Core System 6.3 CS-Studio Release Notes	<a href="#">4G97YB</a>				<a href="#">v1.0</a>	
CODAC Core System CS-Studio User Guide	<a href="#">QVBYD8</a>	<a href="#">v1.2</a>	<a href="#">v1.3</a>	<a href="#">v1.5</a>	<a href="#">v1.6</a>	
Operator Interface standardisation - CSS BOY Edition and Runtime	<a href="#">7367JQ</a>	<a href="#">v1.9</a>	<a href="#">v1.10</a>	<a href="#">v1.11</a>	<a href="#">v1.11</a>	
Operator Interface standardisation - CSS BOY Industrial Symbol Library	<a href="#">A69URK</a>	<a href="#">v2.1</a>	<a href="#">v2.2</a>	<a href="#">v2.2</a>	<a href="#">v2.2</a>	
<b>SLOW CONTROLLERS (PLC) and OPC UA</b>						
SPSS User Manual	<a href="#">G4UMX5</a>	<a href="#">v2.2</a>	<a href="#">v2.6</a>	<a href="#">v2.6</a>	<a href="#">v2.6</a>	
s7PLCAsyn EPICS Driver User's Manual	<a href="#">PJAHXJ</a>	<a href="#">v1.9</a>	<a href="#">v1.10</a>	<a href="#">v1.10</a>	<a href="#">v1.10</a>	
PLC Sample Guide	<a href="#">2N8C3M</a>	<a href="#">v4.2</a>	<a href="#">v4.2</a>	<a href="#">v4.2</a>	<a href="#">v4.2</a>	
OPC UA Integration User Manual	<a href="#">32N6MJ</a>			<a href="#">v1.1</a>	<a href="#">v1.1</a>	<a href="#">v1.3</a>
<b>FAST CONTROLLERS - I/O</b>						
NI Sync Linux Device Driver User's Guide	<a href="#">2PLQ4P</a>	<a href="#">v2.7</a>	<a href="#">v2.7</a>	<a href="#">v2.8</a>	<a href="#">v2.8</a>	
NI Sync EPICS Driver User's Guide	<a href="#">33Q5TX</a>	<a href="#">v2.14</a>	<a href="#">v2.14</a>	<a href="#">v2.14</a>	<a href="#">v2.14</a>	
NI PXI-6259 Linux Driver User's Guide	<a href="#">32GTJY</a>	<a href="#">v1.19</a>	<a href="#">v1.19</a>	<a href="#">v1.19</a>	<a href="#">v1.19</a>	
NI PXI-6259 EPICS Driver User's Guide	<a href="#">3DEY52</a>	<a href="#">v2.12</a>	<a href="#">v2.12</a>	<a href="#">v2.12</a>	<a href="#">v2.12</a>	
NI PXI-6528 Linux Driver User's Guide	<a href="#">3ZHxQ9</a>	<a href="#">v1.8</a>	<a href="#">v1.8</a>	<a href="#">v1.8</a>	<a href="#">v1.8</a>	
NI PXI-6528 EPICS Driver User's Guide	<a href="#">433VEW</a>	<a href="#">v1.13</a>	<a href="#">v1.13</a>	<a href="#">v1.13</a>	<a href="#">v1.13</a>	
NI X-Series Linux Device Driver User's Guide	<a href="#">3LTMR6</a>	<a href="#">v1.7</a>	<a href="#">v2.0</a>	<a href="#">v2.0</a>	<a href="#">v2.0</a>	
NI X-Series EPICS Driver User's Guide	<a href="#">3P4N3R</a>	<a href="#">v1.9</a>	<a href="#">v1.9</a>	<a href="#">v1.9</a>	<a href="#">v1.9</a>	
NI-RIO Linux Device Driver User Manual	<a href="#">LW3UFH</a>	<a href="#">v2.10</a>	<a href="#">v2.10</a>	<a href="#">v2.14</a>	<a href="#">v2.14</a>	
NI-RIO EPICS Device Driver User Manual	<a href="#">RAJ9P8</a>	<a href="#">v1.7</a>	<a href="#">v1.7</a>	<a href="#">v1.7</a>	<a href="#">v1.7</a>	
IRIO Library user's manual	<a href="#">RATM8Z</a>	<a href="#">v1.3</a>	<a href="#">v1.3</a>	<a href="#">v1.3</a>	<a href="#">v1.3</a>	
IRIO Design Rules for LabVIEW for FPGA	<a href="#">QQMYTY</a>	<a href="#">v1.4</a>	<a href="#">v1.4</a>	<a href="#">v1.4</a>	<a href="#">v1.4</a>	
<b>FAST CONTROLLERS – HPN</b>						
TCN API - Software User Manual	<a href="#">N4XTGG</a>	<a href="#">v1.16</a>	<a href="#">v1.16</a>	<a href="#">v1.16</a>	<a href="#">v1.16</a>	
PTPd User Manual	<a href="#">U2TTSZ</a>	<a href="#">v1.4</a>	<a href="#">v1.4</a>	<a href="#">v1.5</a>	<a href="#">v1.5</a>	
TCNd User Manual	<a href="#">MUYNT6</a>	<a href="#">v2.6</a>	<a href="#">v2.6</a>	<a href="#">v2.7</a>	<a href="#">v2.7</a>	
SDN Software User Manual	<a href="#">B7SKFU</a>	<a href="#">v2.12</a>	<a href="#">v2.13</a>	<a href="#">v2.13</a>	<a href="#">v2.13</a>	
SDN Archiver User Manual	<a href="#">SD29MG</a>	<a href="#">v1.4</a>	<a href="#">v1.5</a>	<a href="#">v1.7</a>	<a href="#">v1.7</a>	
RTF User Manual	<a href="#">WBZDRJ</a>		<a href="#">v2.4</a>	<a href="#">v2.4</a>	<a href="#">v2.4</a>	
DAN User Manual	<a href="#">Q6GULS</a>	<a href="#">v3.0</a>	<a href="#">v3.2</a>	<a href="#">v3.6</a>	<a href="#">v3.7</a>	<a href="#">v3.9</a>
Data Visualization Tool User Manual	<a href="#">4N9E8W</a>				<a href="#">v1.2</a>	<a href="#">v1.3</a>