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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

<i>Approval Process</i>			
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Change Log

CODAC Core System Version 6.3 Release Notes (4QKMKL)

<i>Version</i>	<i>Latest Status</i>	<i>Issue Date</i>	<i>Description of Change</i>
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.

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.

Additions for CCS 6.3.0 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 6.3.0 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.
3. A Shift Service has been introduced into the Logbook extensions of CS-Studio.

Warning At the time of 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.

COMPONENTS UPDATE

	Components	6.0	6.1	6.2.0	6.2.1	6.3.0
<u>Operating System</u>	RHEL	7.4	7.4	7.4		7.4
<u>EPICS</u>	EPICS Base					7.0.4.1
	EPICS Base Java	7.0.1	7.0.2	7.0.3.1		7.0.6
<u>Shared Units</u>	Java	1.8.0	1.8.0	11.0.3		11.0.3
	Eclipse	4.6.3	4.7.3	4.11.0		4.16.0
	PostgreSQL	9.6.2	10.5	10.5		10.5
	Tomcat	8.5.13	8.5.13	8.5.13		8.5.13
	Firefox	52.3.0	52.3.0	52.3.0		52.3.0
<u>Control System Studio</u>	CS-Studio	4.5.2	4.6.202	<u>4.6.307</u>	<u>4.6.310</u>	4.7.8
<u>Self Description Data</u>	SDD tools	6.0	6.1.2	6.2	<u>6.2.1</u>	6.3.0
<u>Maven Tools</u>	Maven tools	6.0	6.1.2	6.2.0		<u>6.2.1</u>
<u>Health Monitoring</u>	Health Mon	1.7	2.0	2.0.1		2.0.1
<u>PLC Driver</u>	S7PLC ASYN	1.5	1.6	<u>1.6.1</u>		1.6.1
	SPSS (300/1500)	3.4/1.0	3.5/1.1	3.6/1.1		3.6/1.1
<u>TCN Support</u>	TCN API	3.3.0	<u>3.3.1</u>	3.3.1	<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	1.2.1	1.2.1		1.2.1
<u>SDN Support</u>	SDN API ¹	2.2.0	2.2.0	2.2.0		2.2.0
	SDN Archiver	1.1.0	1.2.0	<u>1.2.1</u>		1.2.1
<u>DAN Support</u>	DAN API	3.1.0	3.2.1	<u>3.2.3</u>		<u>3.2.4</u>
<u>Logging Library</u>	LOG API	1.3.4	<u>1.3.7</u>	1.3.7		1.3.7
<u>NI Sync</u>	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
<u>PXI-6259</u>	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>PXI-6528</u>	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
<u>PXIE-6368 / PXIE-6363</u>	PXIE-6368	3.0.0	3.0.0	<u>3.0.1</u>		3.0.1
	PXIE-6368 EPICS	1.5.0	1.6.1	1.6.1		<u>1.6.2</u>
<u>NI RIO</u>	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
<u>OPC UA</u>	OPC UA Support	p0.9.2	0.5.1	<u>0.5.2</u>		0.8.0
	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.

¹ 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).

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:

Module	Version
EPICS 7 C++	7.0.4.1
EPICS 7 Java	7.0.6
areaDetector²	Core: 3.10 SimDetector: 2.10
ASYN	4.41
Autosave	5.10
Busy²	1.7.2
CA Gateway²	2.1.2
Calc	3.7.3
CaSnooper	2.1.2.3
JCA	2.4.4
Multi-Core Utilities	<u>1.2.2</u>

² 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.

Module	Version
PCAS	4.13.2
pvaPy	3.0.0
PyEpics	<u>3.4.2</u>
Sequencer	2.2.8
Std	<u>3.6.2</u>
StreamDevice	<u>2.8.16</u>
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.

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 ([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 liclept 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 \(4G97YB\)](#).

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 `SIML` 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.

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

No changes.

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 (≤ 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.

12 Logging Library

No changes.

13 NI Sync

No changes.

14 PXI-6259

No changes.

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](#))

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

