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Report

CODAC Core System Version 7.1 Release Notes

This note is a supplementary document for CODAC Core System (CCS) to provide users with information on the changes introduced with the release of the CCS 7.1 version.

<i>Approval Process</i>			
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Change Log

CODAC Core System Version 7.1 Release Notes (8ML7SM)

<i>Version</i>	<i>Latest Status</i>	<i>Issue Date</i>	<i>Description of Change</i>
v0.0	In Work	15 Mar 2023	
v1.0	Signed	21 Mar 2023	Release Notes for CODAC Core System release 7.1.0
v1.1	Approved	24 Mar 2023	- Updated document version numbers - Added NISYNC Linux Manual update

CODAC CORE SYSTEM VERSION 7.1 RELEASE NOTES

[ITER_D_8ML7SM](#)

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 7.1.0 version.

Additions for CCS 7.1.0 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 7.1.0 version
- The [roadmap](#)
- The [training](#) material, which will be updated for hands-on workshops.

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 7.1.0:

1. The Control System Studio suite has been upgraded to version 4.8.1, with lots of enhancements around the Databrowser and Logbook components.
2. The Eclipse framework has been updated to release 4.24 (2022-06).
3. SDD received a lot of bugfixes related to PLC communication issues, including integration of the cubicle monitoring system.

Main changes in Plant Control Design Handbook (PCDH) guidelines:

1. [ITER catalogue for I&C products - Slow controllers PLC \(333J63 v5.1\)](#) – major update of the catalogue, moving from S7-300 to S7-1500 for standard applications and to TIA Portal as development environment
2. [PLC Software Engineering Handbook \(3QPL4H v3.1\)](#) – major update of software programming environment, introduction of Unified Control Library, other development libraries and tools
3. [HMI Style Guide and Toolkit \(3XLESZ v4.0\)](#) - major update with the integration of new Human and Organizational Factors (HOF)

COMPONENTS UPDATE

	Components	6.2	6.3	7.0	7.1
Operating System	RHEL	7.4	7.4	8.5	8.5
EPICS	EPICS Base	7.0.3.1	7.0.4.1	7.0.6.1	7.0.7
	EPICS Base Java		7.0.6	7.0.7	7.0.8
Shared Units	Java	11.0.3	11.0.3	<u>11.0.13</u>	11.0.13
	Eclipse	4.11.0	4.16.0	4.20.0	4.24.0
	PostgreSQL	10.5	10.5	12.9	12.9
	Tomcat	8.5.13	8.5.13	9.0.46	9.0.46
	Firefox	52.3.0	52.3.0	91.4.0	91.4.0
Control System Studio	CS-Studio	<u>4.6.310</u>	4.7.802	4.8.0	<u>4.8.1</u>
Self Description Data	SDD tools	6.2.1	6.3.1	6.4.0	6.5.0
Maven Tools	Maven tools	6.2.0	<u>6.2.1</u>	6.2.1	<u>6.2.3</u>
Health Monitoring	Health Mon	2.0.1	2.0.1	2.0.1	2.0.1
PLC Driver	S7PLC ASYN	<u>1.6.1</u>	<u>1.6.2</u>	1.6.2	<u>1.6.3</u>
	SPSS (300/1500)	3.6/1.1	3.6/1.1	3.6/1.1	3.6/1.1
TCN Support	TCN API	3.3.2	3.3.2	3.3.2	3.3.2
	TCNd	5.2.3	5.2.3	5.2.3	5.2.3
	Unified PTPd	1.2.1	1.2.1	1.2.1	1.2.1
SDN Support	SDN API ¹	2.2.0	2.2.0	2.2.0	2.2.0
	SDN Archiver	<u>1.2.1</u>	1.2.1	1.2.1	1.2.1
DAN Support	DAN API	<u>3.2.3</u>	<u>3.2.4</u>	3.2.4	<u>3.2.5</u>
Logging Library	LOG API	1.3.7	1.3.7	1.3.7	1.3.7
NI Sync	NI SYNC	2.2.1	2.2.1	2.3.0	2.3.0
	NI SYNC EPICS	2.1.2	2.1.2	2.1.2	2.1.2
PXI-6259	PXI-6259	2.5.3	2.5.3	2.6.1	2.6.1
	PXI-6259 EPICS	<u>2.6.2</u>	<u>2.6.3</u>	2.6.3	<u>2.6.4</u>
PXI-6528	PXI-6528	<u>1.3.2</u>	1.3.2	1.4.0	1.4.0
	PXI-6528 EPICS	1.3.4	1.3.4	1.3.4	1.3.4
PXIe-6368 /	PXIe-6368	<u>3.0.1</u>	3.0.1	3.1.0	3.1.0
PXIe-6363	PXIe-6368 EPICS	1.6.1	<u>1.6.2</u>	1.6.2	1.6.2
NI RIO	NI RIO	2.1.1	2.1.1	3.1.0	3.1.0
	IRIO EPICS	1.1.2	1.1.2	1.1.2	1.1.2
OPC UA	OPC UA Support	<u>0.5.2</u>	0.9.2	0.9.2	0.9.2
	OPC UA library	1.5.5	1.5.5	1.7.4	1.7.4

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

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 8.5.

The Linux kernel version is 4.18.0-348:

- 4.18.0-348.7.1 for the default installation
- 4.18.0-348.7.1.rt7.137 for the RT enhanced installation (MRG-R).

Major Changes with respect to CCSv6.x (RHEL 7):

- Package management is done by DNF (YUMv4). The “yum” command provides compatibility with the traditional YUMv3 command line interface. The DNF property “noautoremove” has been made default to ensure continuity of behavior between YUMv3 and DNF.
- The system provided Python version is Python 3.6 (up from 2.7 under RHEL 7). There is no default “python” command anymore.
- The default display server is “Wayland” used by Gnome Display Manager. The classical X-Server is still provided.
- The default network packet filtering (firewall) uses “nftables”, which has replaced the earlier “iptables” framework. By default, CCS does not use the Linux firewall.

2 Installation Tools

Main enhancements:

15059 Installation Tools Update recommended CCS role for different types of installation

Main bug fixes:

14544 Installation Tools codac-initialize causes 'Failed to find any available CCS versions!'

3 CODAC Packaging and OS Integration

Main enhancements:

11570 Packaging codac-configure shall allow the configuration of the archives and urls for the trends

12244 Packaging Merge "mc-devel" role to "devel" role

14483 Packaging Remote execution fails if rsync is not installed on the remote system

14715 Packaging Remove UDA & SUP dependencies from CCS system roles

15075 Packaging Update the package of Python Sphinx to version 5.3.0

Main bug fixes:

13154 Packaging Tomcat log rotation is not working

15077 Packaging org.apache.xml.resolver: Missing Constraint: Require-Capability

4 EPICS

CODAC Core System uses a current release of EPICS 7.

Details for all the community maintained EPICS components included in the CCS 7 distribution are available in the [EPICS Community Modules Roadmap for CCS 7.x \(6C4XTJ\)](#).

The versions included in this release are the following:

Module	Version
EPICS 7 C++	7.0.7.0.ccs1

Module	Version
EPICS 7 Java	7.0.8
PVXS	1.1.1
AreaDetector²	Core: 3.11 SimDetector: 2.10
ASYN	4.43
Autosave	5.10.2
Busy²	1.7.3
CA Gateway²	2.1.3
Calc	3.7.4
CaSnooper	2.1.2.3
JCA	<u>2.4.7</u>
Multi-Core Utilities	1.2.2
Modbus	3.2
PCAS	4.13.3
pvaPy	5.2.1
pyDevSup	1.2
PyEpics	<u>3.5.1</u>
Sequencer	2.2.9
Std	3.6.3
StreamDevice	<u>2.8.24</u>
VisualDCT	2.8.2

Main enhancements:

14438 EPICS Base Reintroduce the ioc-status script

Main bug fixes:

none

5 Shared Units

Changes:

- The Eclipse framework has been updated to release 4.24.

6 Control System Studio (CS-Studio)

In CODAC Core System 7.1, CS-Studio 4.8.1 ITER Edition has been released.

This version is based on Eclipse 2022-06 (4.24) [bug 14515] with Tycho 2.7.5, Batik 1.14, PyDev 9.3, PostgreSQL JDBC driver 42.4.0 [bug 14517], EPICS JCA 2.4.7 [bug 14822], PostgreSQL 12 and ELK stack 7.17 (compatible with OpenJDK 11) [bug 14516]. Community contributions have been integrated [bug 14513].

With the EPICS JCA library upgrade, the known issues related to PV Access are solved [bugs 13282, 13281, 14690].

The most important enhancements and bug fixes for the user are described in more detail in the document [CODAC Core System Version 7.1 CS-Studio Release Notes \(8NU8FA\)](#).

² The RPMs are not installed as part of a CCS system profile. They shall be installed as required, see the CCS 7.x EPICS Roadmap for details.

6.1 Table of Main Enhancements

14471	CSS BEAST	Alarm server and notifier log file specific to an alarm root
14610	CSS BEAST	Alarm notifier maintenance mode
14621	CSS BEAST	Alarm server latched alarms behaviour
14677	CSS BEAST	Alarm notifier latched alarms information
14696	CSS BEAST	Alarm priority revised according to HOF requirements
14852	CSS BEAST	Alarm Configuration Tool >> send unnecessary JMS CONFIG message
14853	CSS BEAST	Alarm Configuration Tool >> option -send_jms_config
13834	CSS BEAUTY	Databrowser plot >> Plot annotation added at the cursor position
13835	CSS BEAUTY	Databrowser plot >> Plot annotation easy selection
13836	CSS BEAUTY	Databrowser plot >> Plot annotation easy move
14124	CSS BEAUTY	Databrowser plot >> Show PV Disconnections Databrowser plot >> Draw PV limits dashed lines: Display (by default), Alarm, and Warning
14127	CSS BEAUTY	Alarm, and Warning
14128	CSS BEAUTY	Databrowser plot >> Draw threshold
14960	CSS BEAUTY	Databrowser plot >> Show Value Labels new preference
14977	CSS BEAUTY	Databrowser plot >> preferences update
14978	CSS BEAUTY	Databrowser plot >> new background and trace colors preferences
14899	CSS BOY	XY Graph trace shall not use alarm color coding
15018	CSS BOY	CS-Studio refresh workspace takes time in operation
14591	CSS ELog	ELOG >> entry search >> shortcuts
14589	CSS ELog	ELOG >> entry search >> time search
14592	CSS ELog	ELOG >> Extended Entry Levels
14593	CSS ELog	ELOG >> Colour code identification for entry levels
14842	CSS ELog	Logbook WebUI >> Sign-in author
14973	CSS ELog	ELOG >> entry search >> extended options
15016	CSS ELog	ELOG >> Colour code identification for logbooks
15026	CSS ELog	ELOG >> Colour code identification for shift CS-Studio launcher scripts support of multiple instances and user arguments
14308	CSS General	arguments
14513	CSS General	CS-Studio community code integration
14515	CSS General	Support of Eclipse 2022-06 (4.24)
14403	CSS General	Support of PostgreSQL JDBC driver 42.3.3
14404	CSS General	CS-Studio community code integration
14512	CSS General	CS-Studio release notes
14514	CSS General	CS-Studio user documentation update
14516	CSS General	Support of ELK stack version 7.17 compatible with OpenJDK 11
14517	CSS General	Support of PostgreSQL JDBC driver 42.4.0
14822	CSS General	Update JCA to version 2.4.7

6.2 Table of Main Bug Fixes:

14714	CSS BEAST	Message History LOG database schema >> CBS5 alarm path size exceeds the column size
14805	CSS BEAST	Beast alarm client model loading issue in production
14850	CSS BEAST	Alarm notifier triggers automated actions for active alarms when the alarm model is reloaded
14787	CSS BEAUTY	Databrowser plot >> Post Analyzer Export - timestamp issue

14913	CSS BEAUTY	Databrowser plot >> Formula does not work
15057	CSS BEAUTY	Databrowser plot >> extrapolated displayed value for DIRECT trace type
14588	CSS BEAUTY	Databrowser plot >> 0 binary value set the auto-scaled Y-axis to [0..10]
14713	CSS BEAUTY	Archive engine write issue on STRING sample that contains a separator
15096	CSS BEAUTY	Databrowser plot >> plot sample value precision
15117	CSS BEAUTY	Databrowser plot >> grey plot area in the future issues
14583	CSS BOY	WebOPI >> An internal error occurred during: "Loading SVG Image..."
14584	CSS BOY	WebOPI >> Navigation buttons font too large
14585	CSS BOY	WebOPI >> Faceplate font too large
14914	CSS BOY	OPI runtime does not show Send Email popup in Full-Screen
15030	CSS BOY	OPI >> tooltip display time preference
14803	CSS BOY	Alarm Beast Datasource >> Root not found issue
14890	CSS BOY	XYGraph widget set ranges from PV issue
14964	CSS BOY	XYGraph widget limits from PV property for all Y-Axis
14468	CSS BOY	Combo box widget height shall be configurable
14314	CSS ELog	ELOG >> File attachment >> fails to open PDF and CSV/XLSX files
14318	CSS ELog	ELOG >> Entry title on multiple lines
14377	CSS ELog	ELOG >> Entry and Shift Templates >> service does not start
14405	CSS ELog	ELOG >> Create/Update Log Entry >> font and toolbar too small
14788	CSS ELog	ELOG >> PDF export error "fo:list-block"
14406	CSS ELog	ELOG >> WebUI >> Author of the modification issue
14990	CSS ELog	ELOG >> runtime exception at startup in operation
14380	CSS General	Sync System PYTHONPATH
13281	CSS General	PV Access in CS-Studio operator interface - RPC VTable result column order issue
13282	CSS General	PV Access in CS-Studio operator interface - RPC VTable result boolean cast issue
14690	CSS General	PV Access in CS-Studio operator interface - unexpected exception caught while calling RPCServiceAsync.request
14869	CSS General	codac-configure for CBS1-CBS2

6.3 Known Bugs and Limitations

Bug	13986	BOY >> Reordering widgets in outline view makes them lose properties
Bug	14236	ELOG >> deleted entry >> return state by the service is incorrect

7 Self Description Data Tools

In CODAC Core System 7.1, the version of SDD Tools is **6.5**. No significant changes were made to SDD Tools in this release.

Main enhancements:

13886	SDD Editor	Command line interface for CSV importing
14747	SDD Editor	do not require a data type for "opcuaItem" record
14748	SDD Editor	opcuaItem.SCAN should default to "Passive"
14837	SDD Editor	Custom IOC and PLC IOC generate duplicated connections to the PLC
15027	SDD Editor	Incorrect function name when instantiating a User Template for POC control unit
13315	SDD General	Add a switch "suppress SYSM IOCs" for development and test
14365	SDD Sync	SDD: update static data for CCS 7.1

14280 SDD Translator Prevent generation when control units have duplicate index

Main bug fixes:

13439	SDD Editor	Beast.xml generated by SDD-Editor does not contain cubicle monitoring configuration
14278	SDD Editor	PVs marked as not visible on HMI require DRVL, DRVH, LOPR and HOPR fields defined
14344	SDD Editor	User defined interface versions get appended on envSysm
14383	SDD Editor	PLC DBs not generated when "Generate one IOC per PLC" is selected
14448	SDD Editor	Generate one IOC per PLC option is not active by default
14545	SDD Editor	OPC-UA window is empty for second PLC
14546	SDD Editor	Duplicate record fields when record type is changed via Excel import
14549	SDD Editor	templates are shown as deprecated (red)
14578	SDD Editor	System template with WIDGET_TYPE macro in BOY template location cannot be imported into database
14601	SDD Editor	Import of SimpleCommand variables is not working
14684	SDD Editor	cubicle monitoring PLC reported as disconnected
14877	SDD Editor	'Generate Multiprojec Config Files' fails to lazily initialization
14903	SDD Editor	Simple commands Description warning when importing from Excel file
13440	SDD Editor	Beauty.xml generated by SDD-Editor doesn't not contain PV related to cubicle monitoring
14866	SDD Editor	Null pointer exception for EPICS Details if variable has no deployment target defined
14281	SDD General	Incorrect st.cmd for POC devices
14057	SDD Sync	Cannot import project xml in SDD Editor from file path with whitespaces: Invalid Tag name or version
14109	SDD Sync	pre-6.2 project containing cubicles misses cubmon PVs on 6.2+ systems
14430	SDD Sync	Empty "IOC name" field for PLC system variable after migration
14500	SDD Sync	PLC sample is not pre-loaded in SDD database by default in CCS 7.0
14520	SDD Sync	Missing fields on opcuaItem
14367	SDD Translator	Substitutions file generated S7 simplecommands are only created for first PLC
14370	SDD Translator	In multi-PLC setup with single IOC, driver setup is only generated for one PLC
14400	SDD Translator	IOModule template PVs loaded as DB file and via substitution file
14478	SDD Translator	Fix SDD created S7 simplecommand records
14523	SDD Translator	a cubicle monitoring project contains two IOCs connecting to the same PLC
14570	SDD Translator	callbackSetQueueSize duplicated on OPC-UA project
14575	SDD Translator	SDD Translator incorrectly calculating offsets when CBS level of PLC PVs alphabetically starts after SYSM
14625	SDD Translator	SDD Translator duplicates CUB variables when generating db files when CBS level of PLC PVs alphabetically starts after SYSM
13323	SDD Translator	NPE when trying to create configuration (from scratch) for m-epics-pxie6368
14908	SDD Translator	dbToLoad.cmd is missing to load .dbs related to variables deployed on the second conventional PLC

Notable remaining issues (if you run into one of these, please contact CODAC support):

10764	SDD Database	problem loading old project with signals
11507	SDD Editor	Importing from another project vis XLS files fails

13557	SDD Sync	POS.h and COSPSOS_BUIL_F000.st file are not getting created while loading via sync-direct
14277	SDD Editor	SDD-editor doesn't generate the files and records correctly for PXI6259

SDD reference data has been updated in this release:

- PBS snapshot version 20230130;
- CBS snapshot version 20230131;
- GBS snapshot version 20190204 (no changes);
- TTT snapshot version 20230130;
- AAAA snapshot version 20230130;
- 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).

8 Maven Tools

Main enhancements:

14646	Maven commands	Support external issue report for Parasoft issues
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Main bug fixes:

15270	Maven commands	Maven remote commands for importing alarm and archive configuration (mvn beauty & beast) are broken
12450	Maven commands	Migration from CCSv6.0 to CCSv6.1.2 does not create the missing OPI_FILE macro
14482	Maven commands	Remote execution is broken if the maintenance version on remote system is different

9 Health Monitoring

No changes.

10 PLC Driver

SPSS versions:

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

Bug fixes:

14709	S7 EPICS Driver	Partial writes of configuration data blocks cause misalignment on PLC side
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11 TCN/PTP Support

No changes.

12 SDN Support

Main enhancements:

14996 SDN API Support for configuring TTL of SDN traffic via SDN_IP_TTL environment variable and the SDN API

Main bug fixes:

15029 SDN Archiver sdn-archiver is discarding recvBuff size and queueSize from the XML config

13 DAN/UDA Support

Main enhancements:

15031 DAN Archive Support an option to pass the configuration file as an argument
15098 UDA UDA REST : add a method to call uda-get-var-meta

Main bug fixes:

14319 DAN General redefinition of some #define HDF_XXX

14 Logging Library

No changes.

15 NI Sync

No changes.

16 PXI-6259

Bug fixes:

14474 PXI-6259 EPICS Sampling rate is higher than configured

17 PXI-6528

No changes.

18 PXIe-6368 / PXIe-6363 (X-Series)

No changes.

19 NI RIO

No changes.

20 OPC UA

The current version of OPC UA Device Support includes full support for OPC UA Security.



*OPC UA Security is enabled by default.
To connect to any OPC UA server without security, you must set the option
sec-mode=None
for the concerned session(s).*

Using OPC UA Security is not trivial and needs careful planning and consideration. Please refer to the OPC UA User Manual for more details.

21 Other Components

No changes.

DOCUMENTATION UPDATES

Document	ID	6.2	6.3	7.0	7.1
CODAC Core System v7.1 Release Notes	8ML7SM				v1.1
CODAC Core System v7.1 CS-Studio Release Notes	8NU8FA				v1.0
CODAC Core System Overview	34SDZ5	v6.2	v6.3	v7.0	v7.1
CODAC Core System User Manual	43PSH9	v3.12	v3.13	v3.14	v3.15
INSTALLATION & SUPPORT					
CODAC Core System Installation Manual	33JNKW	v6.1	v6.5	v7.0	v7.1
CODAC Core System Migration Manual	7JCFUD	v5.9	v5.10	v5.11	v5.12
DEVELOPMENT & TESTING					
CODAC Core System App Development Manual	33T8LW	v5.7	v5.8	v5.8	v5.9
SDD Editor User Manual	32Z4W2	v9.0	v9.1	v10.0	v10.3
How to include a new I/O module in SDD	A4WQDZ	v2.0	v2.0	v2.0	v2.0
Maven Editor User Guide	7MT2YC	v5.10	v5.11	v5.11	v5.11
System Health Monitoring Variables	35XFCY	v2.0	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 CS-Studio User Guide	QVBYD8	v1.5	v1.6	v1.6	v1.7
OPI Standardisation - CSS BOY Edition and Runtime	7367JQ	v1.11	v1.11	v1.12	v1.13
OPI Standardisation - CSS BOY Industrial Symbol Library	A69URK	v2.2	v2.2	v2.3	v2.4
SLOW CONTROLLERS (PLC) and OPC UA					
SPSS User Manual	G4UMX5	v2.6	v2.6	v2.6	v2.6
s7PLCAsyn EPICS Driver User's Manual	PJAHXJ	v1.10	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	v1.3	v1.3	v1.3
FAST CONTROLLERS - I/O					
NI Sync Linux Device Driver User's Guide	2PLQ4P	v2.8	v2.8	v2.8	v2.9
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	v2.0	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	v2.14	v2.14	v2.15	v2.15
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	v1.5	v1.5	v1.5	v1.5
TCNd User Manual	MUyNT6	v2.7	v2.7	v2.7	v2.7
SDN Software User Manual	B7SKFU	v2.13	v2.13	v2.13	v2.13
SDN Archiver User Manual	SD29MG	v1.7	v1.7	v1.7	v1.7
RTF User Manual	WBZDRJ	v2.4	v2.4	v2.4	v2.4
DAN User Manual	Q6GULS	v3.6	v3.9	v3.9	v3.10
UDA User Manual	TPLTKG	v2.0	v2.1	v2.2	v2.2
Data Visualization Tool User Manual	4N9E8W		v1.3	v1.3	v1.3