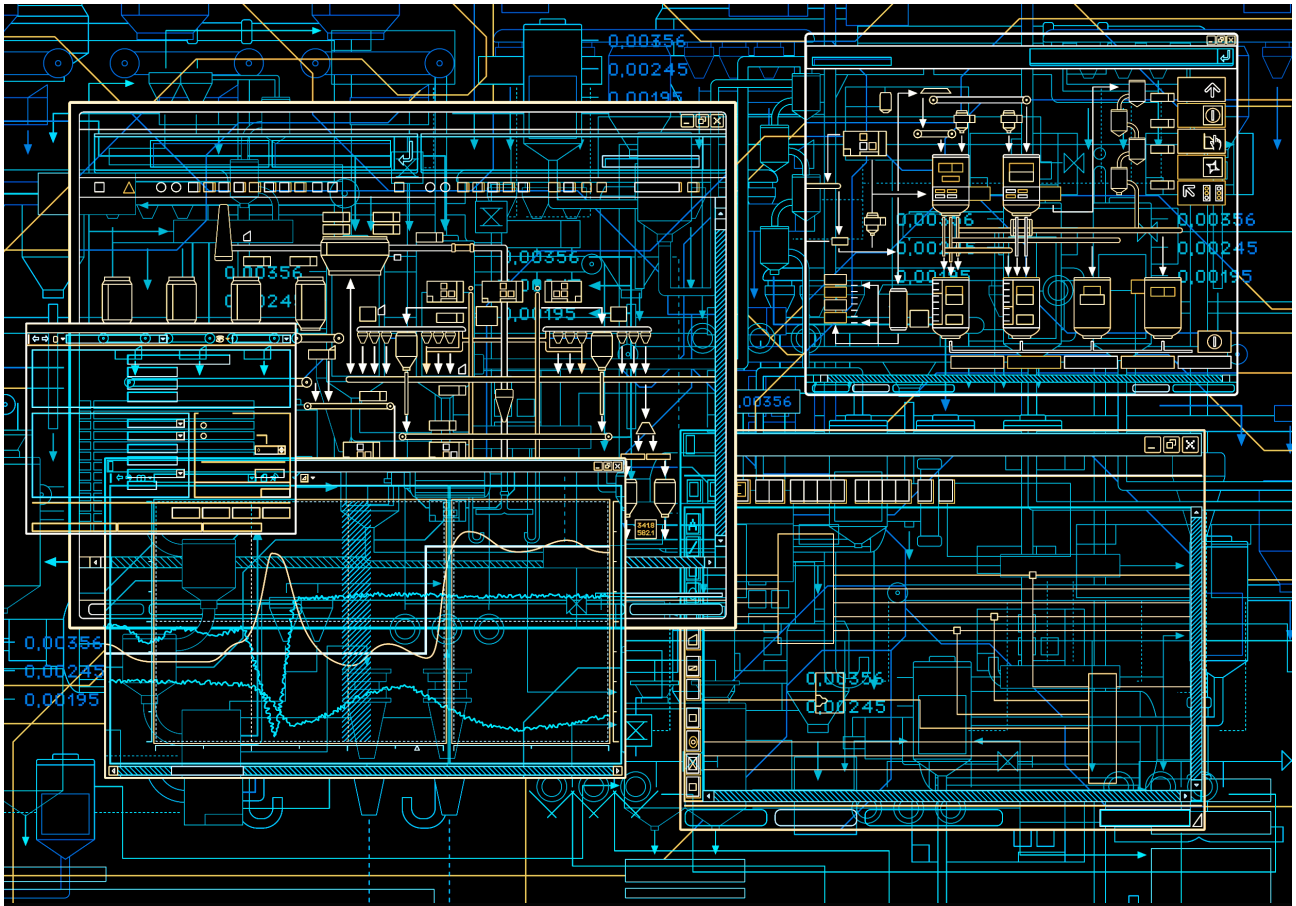

800xA for DCI

Configuration

System Version 5.1

Power and productivity
for a better world™

800xA for DCI

Configuration

System Version 5.1

NOTICE

This document contains information about one or more ABB products and may include a description of or a reference to one or more standards that may be generally relevant to the ABB products. The presence of any such description of a standard or reference to a standard is not a representation that all of the ABB products referenced in this document support all of the features of the described or referenced standard. In order to determine the specific features supported by a particular ABB product, the reader should consult the product specifications for the particular ABB product.

ABB may have one or more patents or pending patent applications protecting the intellectual property in the ABB products described in this document.

The information in this document is subject to change without notice and should not be construed as a commitment by ABB. ABB assumes no responsibility for any errors that may appear in this document.

In no event shall ABB be liable for direct, indirect, special, incidental or consequential damages of any nature or kind arising from the use of this document, nor shall ABB be liable for incidental or consequential damages arising from use of any software or hardware described in this document.

This document and parts thereof must not be reproduced or copied without written permission from ABB, and the contents thereof must not be imparted to a third party nor used for any unauthorized purpose.

The software or hardware described in this document is furnished under a license and may be used, copied, or disclosed only in accordance with the terms of such license. This product meets the requirements specified in EMC Directive 2004/108/EC and in Low Voltage Directive 2006/95/EC.

TRADEMARKS

All rights to copyrights, registered trademarks, and trademarks reside with their respective owners.

Release: July 2015
Document number: 3BUA000135-510 B

Table of Contents

About This User Manual

General 9
User Manual Conventions 9
Warning, Caution, Information, and Tip Icons 9
Terminology 10
Released User Manuals and Release Notes 11

Section 1 - Introduction

Product Overview 13
Functional Description 13

Section 2 - Composer CTK Support Services

Introduction 15
800xA Tag List Export 15
DCU Manager 16

Section 3 - DCI Tag Importer

Introduction 17
- Operation 17
- Function 18
- Advanced Function 20

Section 4 - Network Services

Introduction 23
DCU Connectivity 23
Conductor NT/UX Synchronization 24

Time Synchronization of DCU 24
Service Startup 25
List of Required DCI Network Services 25

Section 5 - Creating DCI OPC Server

Introduction 27
Creating DCI OPC Server 27

Section 6 - Configuring the DCI AE Event Collector Structure

Introduction 31
Configuring DCI AE Event Collector Structure 31

Section 7 - Control Object Type Definition

Introduction 35
Standard DCU Module Types 35
CIO Module Types 36
    Object Types Structure 36
CCAs 36
    Data Type Conversion 37
    Array Handling 38
    Object Type Definition for Symphony DCI OPC Control Network 38

Section 8 - Security

Introduction 39
DCI Security 40
800xA System Security 40
Composer CTK Security 41
800xA for DCI Firewall Configuration 42
800xA for DCI and IPSec 43

Section 9 - Administration

Introduction 45
Configure Users and Security 45

Index

Revision History

Introduction 49
Revision History 49
Updates in Revision Index A 49
Updates in Revision Index B 50

About This User Manual

General

Any security measures described in this user manual, for example, for user access, password security, network security, firewalls, virus protection, etc., represent possible steps that a user of an 800xA System may want to consider based on a risk assessment for a particular application and installation. This risk assessment, as well as the proper implementation, configuration, installation, operation, administration, and maintenance of all relevant security related equipment, software, and procedures, are the responsibility of the user of the 800xA System.

This user manual describes the configuration steps related to 800xA for DCI.

User Manual Conventions

Microsoft Windows conventions are normally used for the standard presentation of material when entering text, key sequences, prompts, messages, menu items, screen elements, etc.

Warning, Caution, Information, and Tip Icons

This User Manual includes Warning, Caution, and Information where appropriate to point out safety related or other important information. It also includes Tip to point out useful hints to the reader. The corresponding symbols should be interpreted as follows:

Electrical warning icon indicates the presence of a hazard that could result in *electrical shock.*

Warning icon indicates the presence of a hazard that could result in *personal injury.*

Caution icon indicates important information or warning related to the concept discussed in the text. It might indicate the presence of a hazard that could result in *corruption of software or damage to equipment/property.*

Information icon alerts the reader to pertinent facts and conditions.

Tip icon indicates advice on, for example, how to design your project or how to use a certain function

Although Warning hazards are related to personal injury, and Caution hazards are associated with equipment or property damage, it should be understood that operation of damaged equipment could, under certain operational conditions, result in degraded process performance leading to personal injury or death. Therefore, fully comply with all Warning and Caution notices.

Terminology

A complete and comprehensive list of terms is included in *System 800xA System Guide Functional Description (3BSE038018*)*. The listing includes terms and definitions that apply to the 800xA System where the usage is different from commonly accepted industry standard definitions and definitions given in standard dictionaries such as Webster's Dictionary of Computer Terms. Terms that uniquely apply to this User Manual are listed in the following table.

Term/Acronym	Description
CCL	Controlware™ Command Language – creates Controlware phase logic executed by the DCU.
Composer™ CTK	CTK - Configuration Tool Kit.
Conductor	Refers to Symphony™ console applications such as Conductor NT or Conductor UX products.They interface to multiple ABB systems.
Controlware	Harmony/DCI based control logic utilizing softwiring between function modules.

Term/Acronym	Description
DCU	Distributed Control Unit (Harmony DCI Controller).
GDBA	Global Database Access (Harmony DCI).

Released User Manuals and Release Notes

A complete list of all User Manuals and Release Notes applicable to System 800xA is provided in *System 800xA Released User Manuals and Release Notes (3BUA000263*)*.

System 800xA Released User Manuals and Release Notes (3BUA000263)* is updated each time a document is updated or a new document is released. It is in pdf format and is provided in the following ways:

- Included on the documentation media provided with the system and published to ABB SolutionsBank when released as part of a major or minor release, Service Pack, Feature Pack, or System Revision.
- Published to ABB SolutionsBank when a User Manual or Release Note is updated in between any of the release cycles listed in the first bullet.

A product bulletin is published each time *System 800xA Released User Manuals and Release Notes (3BUA000263*)* is updated and published to ABB SolutionsBank.

Section 1 Introduction

Product Overview

The 800xA for DCI software product integrates the Harmony Distributed Control Unit (HDCU) controllers with the 800xA System. The Connectivity is accomplished through a pair of OPC® Data Access and Alarm & Event Servers.

800xA for DCI communicates with the Harmony DCU controllers on the DCI Control Network (CNet). Redundant communication can be provided through the ECC MUX software. Single network communication can be provided through a third-party Ethernet NIC card.

800xA for DCI also includes DCI-specific PG2 and VB6 Faceplates and graphical elements, and an interface for Harmony DCUs to 800xA Batch.

800xA for DCI requires a companion product Composer CTK, which is a software package that provides an integrated set of configuration tools in a graphical user environment for building HDCU control strategies. CTK is required to co-exist on the on the DCI Control Network (CNet) with 800xA for DCI to handle the configuration of HDCU controllers while establishing and maintaining devices on the DCI control network.

Refer *Composer CTK User's Guide (3BUA000315*)* for instructions on how to use the features needed to support 800xA for DCI.

Functional Description

800xA for DCI provides a pair of OPC® Servers to transfer data between Harmony DCUs and System 800xA. The Data Access (DA) Server provides the ability to write and read data to/from the Harmony DCU. The Alarm & Event server provides access to alarm and event data from the Harmony DCUs. The 800xA for DCI

Connectivity Server connects to both the DCI Control Network (CNet) and the 800xA network to transfer the data.

The 800xA for DCI package also includes DCI-specific PG2 and VB6 Faceplates and graphical elements, and an interface for Harmony DCUs to 800xA Batch.

800xA for DCI Connectivity Servers can be made redundant for increase reliability and availability.

Together these features facilitate the evolution of DCI System Six systems to System 800xA.

Section 2 Composer CTK Support Services

Introduction

Composer CTK is the tool that makes editing DCI tag object instance definitions possible. Once they are edited, these changes can be exported from Composer CTK using 800xA Tag List Export and then imported into the 800xA system using the DCI Tag Importer. Refer Section 3 for instructions on DCI Tag Importer.

800xA Tag List Export

The DCI Tag Importer aspect of the 800xA for DCI software requires a list of tag names and other module information so that it can create tag objects corresponding to DCU databases. The 800xA tag list is an XML file that contains the following information:

- Name - Name of the DCU module.
- Type - ASCII name of DCU Module Type.
- FIX - Numeric value indicating the Function of the designated module type.
- Description - Description entered by the user of the module (LEG atom).
- Project - Name of the CTK project to which the module has been assigned. When used for online controllers, the Project Name is blank.
- Controller - Name of the controller to which the module has been assigned. If the module was taken from a CTK project and was not assigned to a controller, the string UNASSIGNED will be used.
- Area - Area (number) to which the module has been assigned.

Refer *Section 6* in *Composer CTK User's Guide (3BUA000315*)* for instructions about using 800xA Tag List Export.

DCU Manager

The DCU Manager icon launches a suite of utilities to configure and manage Harmony DCUs. This suite includes:

- DCU Status Display
- Network Device Assignment
- DCU Resident Configuration
- DCU Support Services
- DCU Operations
- DCU File Operations
- Program Download
- Database Download and Updump
- CCL Editing

Refer *Section 26* in *Composer CTK User's Guide (3BUA000315*)* for instructions about using DCU Manager.

Section 3 DCI Tag Importer

Introduction

The DCI Tag Importer utility imports DCU configuration data from the DCU modules. All configuration changes must be made in Composer CTK and then imported into 800xA using the DCI Tag Importer aspect as shown in Figure 1.

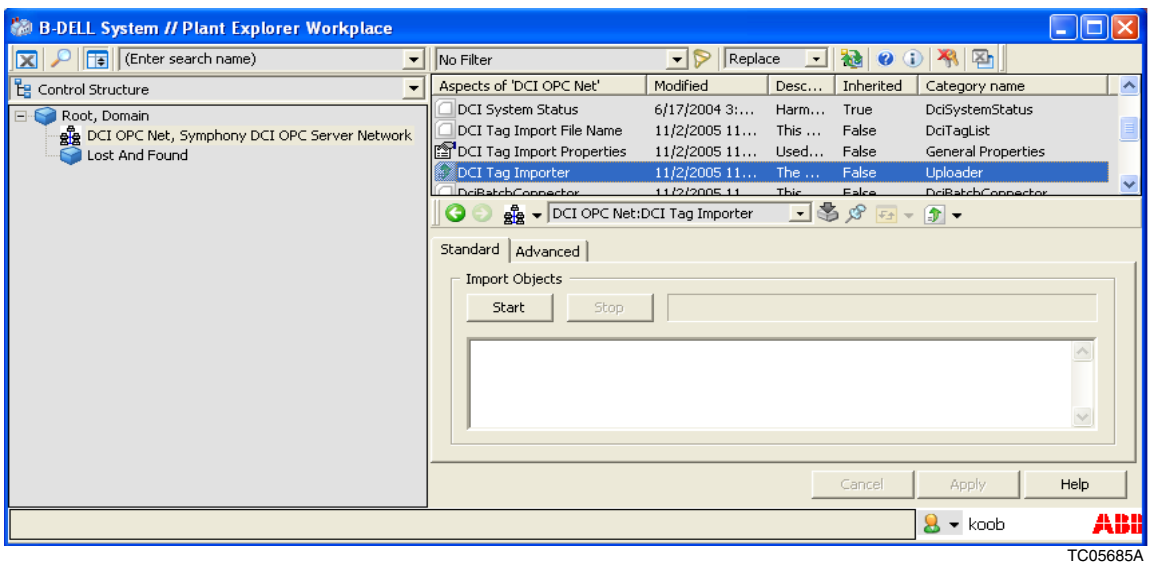

Figure 1. DCI Tag Importer Aspect

Operation

The DCI Tag Importer is an aspect of the DCI OPC Server Network Object that can be found in the Control Structure of 800xA (Figure 1). By selecting the aspect, **DCI Tag Import**, Figure 2 is displayed. Refer to the *800xA for DCI Configuration*

(3BUA000135)* instruction for more information on exporting DCU tag data.

Function

Figure 2 shows the Start and Stop function on the Standard Tab of the DCI Tag Importer that allows the user to begin the import operation. When the **Start** button is clicked, the Tag Importer will retrieve the XML file name from the Tag Import File Name aspect. If the File Name aspect is not configured, the Tag Importer will request the file name and then save the specified name in the File Name aspect. Refer to Figure 1 for the location of the Tag Import File Name Aspect.

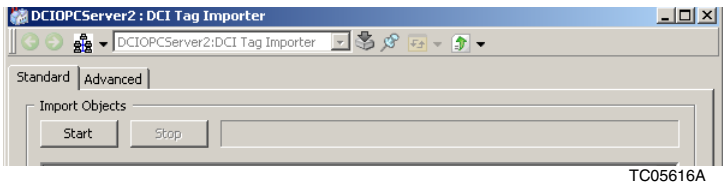

Figure 2. DCI Tag Importer Aspect - Separate Window

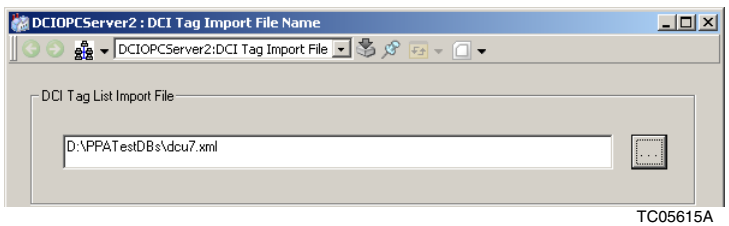

Figure 3. DCI Tag Import File Name

The XML file is the output of the Composer CTK 800xA Tag List export tool. This XML file is used as input to the retrieve phase of the Tag Import operation; the output of this phase is an OCS file. The OCS file is then used in the append phase to generate the Tag Objects in the Control Structure.

When the start button is clicked, both the retrieve and append phases are run in sequence. The status of the operation is shown in the text window.

Figure 4 shows the tags from the Tag List file as they are typically used to populate the Control Structure. The tags are arranged alphabetically under the HDCU Controller in which they reside.

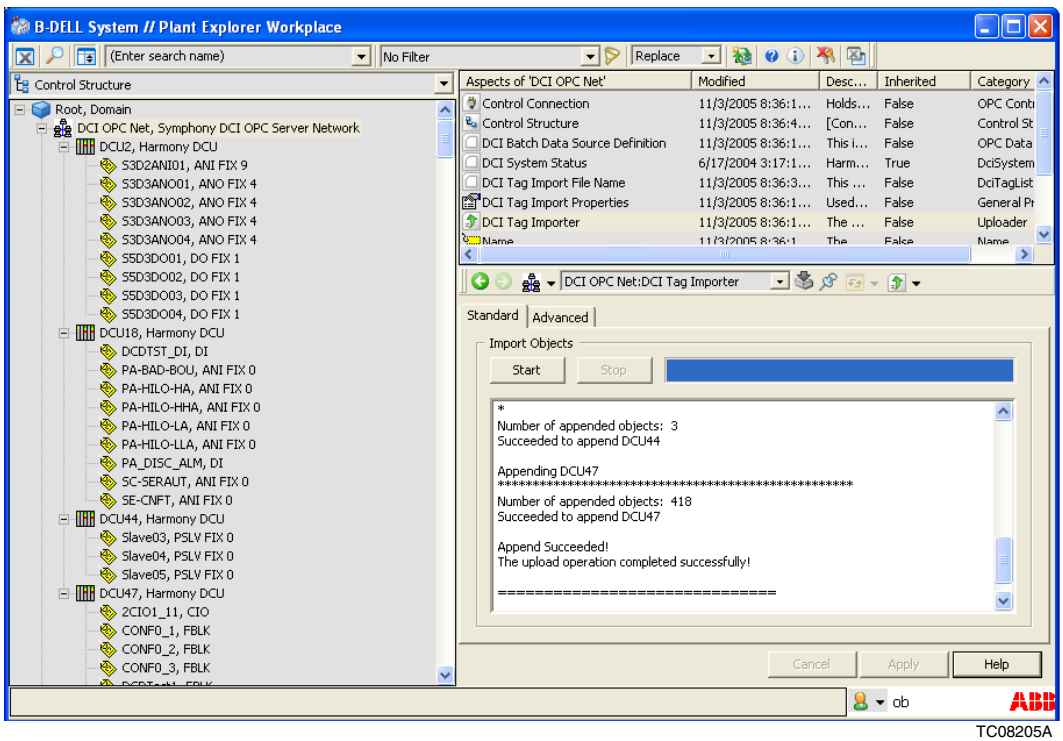

Figure 4. Control Structure Without Batch

If the DCI Batch System Extension has been loaded, the tags in the Control Structure will be arranged in batch Unit groupings.

To avoid problems with the DCI Tag Importer when using DCI Batch, make sure that the DCU is online when importing tags. When the DCU is online, the MSET will be nonzero.

Advanced Function

The Advanced Tab containing the OCS file name information is shown in Figure 5.

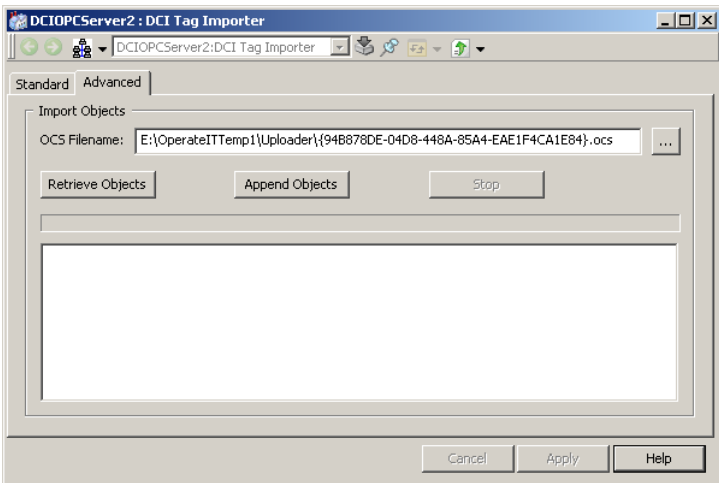

Figure 5. Advanced Tab - OCS Filename

This tab allows the two phases of the Tag Import (retrieve and append) to be run independently. The default OCS file name is specified in the OCS Filename edit box and can be changed if desired. If the OCS file name is changed, the Apply button must be clicked for the new file to be recognized by either phase of the operation. The retrieve phase should be run first to load the XML file specified in the DCI Tag Import File Name aspect.

If the XML filename aspect is blank, a filename will be requested when the Retrieve Objects button is clicked. The append phase should be run to load the OCS file specified in the OCS Filename box and create the Tag objects in the Control Structure.

Although the DCI Tag Importer creates all imported DCU node objects in the Symphony DCI OPC Server Network object of the Control Structure, other DCI network node objects, such as the 800xA for DCI connectivity servers, are not created.

Since alarms cannot be seen unless an object is associated with the alarm, it is recommended that objects be created for the connectivity server nodes and other DCI nodes.

To prevent important alarms and events from being lost:

1. Create a new object of type *Generic OPC Object* under the Symphony DCI OPC Server Network object in the Control Structure.
2. Name the object *DCIx* where *x* is the DCI Node Number (example: DCI6). This Node Number can be obtained from the ABB 800xA for DCI Maintenance Utility which can be entered from:

Start > All Programs > ABB Industrial IT 800xA > 800xA OCS Systems > DCI > DCI Maintenance

3. Repeat Steps 1 and Steps 2 for all non-DCU DCI nodes on the network.
4. Restart the Event Collector for the DCI OPC AE Server. (Disable, then re-Enable the DCI Service Group under [Service Structure]/Services/Event Collector).

Section 4 Network Services

Introduction

800xA for DCI uses a subset of Conductor NT Network Services for tasks such as DCU data access, time synchronization, and table synchronization. A complete list of services used is given in Table 2 below.

DCU Connectivity

The DCU has several interfaces for accessing (reading and writing) its internal data. The most prominent one is Symphony DCI Global Database Access (GDBA). Other interfaces are used much less often and are not used at all for process data. The Conductor NT Network Services have built-in support for all of the interfaces as shown in Table 1.

Table 1. Data Access Interfaces From DCU

Interface	Name	Type of Data
Global Database Access	GDBA	Process Data
System Operations	SysOps	DCU internal board information and status.
Node Introduction	NodeIntro	Node and network connection status
Alarm/Event Messaging	Event Service	DCU Alarm and events
Other Interfaces	Various	—

Conductor NT/UX Synchronization

The 800xA for DCI Connectivity Server can be co-resident with Conductor NT and Conductor UX on the DCI Control Network (CNet). This requires synchronization of various network global tables. The DCI connectivity tasks are responsible for maintaining and establishing the tables such as the Network Device Assignment table.

Time Synchronization of DCU

The 800xA for DCI connectivity server performs time synchronization to other Symphony DCI nodes. The time synchronization is performed by the TSYNCD DAEMON. The time synchronizer is responsible for synchronizing time with the DCU, Composer CTK, and Conductor NT/UX nodes on the same network.

Propagate 800xA System Time to the HDCU Controller Nodes

In an 800xA network, careful consideration must be given to the integration of DCI time synchronization with the 800xA System. If multiple DCI System 6 control networks are used, it is *always* recommended to propagate the 800xA time down to the HDCU controller nodes, and all other nodes on the control network that participate in the DCI System 6 time synchronization method, such as Composer CTK and Conductor NT/UX nodes.

To force this, the 800xA for DCI Connectivity Server Nodes must have their time synchronization priority set *higher* than any existing node on the DCI System 6 control network. Follow the steps below to set the time synchronization priority:

1. Open the DCI Maintenance Utility on the 800xA for DCI Connectivity nodes.
2. On the **Basic** menu, set the **Time Synchronization Priority** to a number higher than the number set on any Composer CTK or Conductor NT/UX nodes.

Propagate HDCU Time to the 800xA System Node (DCI Connectivity Server)

If it is necessary to force the time from the DCI System 6 control network up to the 800xA network, the 800xA for DCI Connectivity node must be configured as the time master on the 800xA network. Follow the steps below to configure DCI Connectivity node as time master:

1. In the Service Structure, on the Server Object for Time:
   a. Enable the Service Provider for the 800xA for DCI Connectivity Server.
   b. Disable the Service Provider for other nodes.
2. In the Node Administration Structure, on the Node Object for the 800xA for DCI Connectivity Server:
   a. Open the Time Server Client Configuration Aspect.
   b. Click to set the **Allowed to Set Time** control.
   c. Disable it for other nodes.

On systems with multiple DCI System 6 control networks, forcing the time up from the conrol network is *not recommended*, as it may result in multiple time sources and can also cause time to switch back and forth on the 800xA network.

Service Startup

The startup sequencing of the DCI network services is controlled by a task similar to Conductor NT NWKSER service.

List of Required DCI Network Services

The following table (Table 2) lists the Conductor Network Services used by 800xA for DCI.

Table 2. Conductor Network Services used by 800xA for DCI

Service Number	Service Name	Description
10	N_MSG_SRVC	Message server
11	N_MESSAGE_SRVC	Service for message broadcast
12	N_TAB_SRVC	Global tables service
14	N_TAB_SRVC	Event subsystem - Alarm server
16	N_DCU_ALARM_UPDATE_SRVC	DCU Event subsystem - Update server

Table 2. Conductor Network Services used by 800xA for DCI (Continued)

Service Number	Service Name	Description
19	N_XDC_ALARM_UPDATE_SRVC	XDC event subsystem - Update server
21	N_TABI_SRVC	Internal global tables
22	N_EVENT_EVTMSG_SRVC	Event subsystem - Message server
23	N_FSN_SRVC	File sync service
25	N_EVTBIT_SRVC	Event bit service
32	N_DBASER_SRVC	DBA access box server
33	N_LICENSE_SRVC	Software license server
56	N_MBIT_SRVC	Event bit update messages
59	N_LOCAL_LIC_SRVC	Local license counter service
60	N_TABIS_SRVC	Table sync service
61	N_CLIENT_INFO_SRVC	Client information request service
62	N_SYS_TAB_SRVC	Global tables - system wide‘
63	N_SYS_TABI_SRVC	Internal global tables - system wide
64	N_SYS_TABIS_SRVC	Table sync service - system wide

Section 5 Creating DCI OPC Server

Introduction

This section describes the procedure for creating DCI OPC Server.

Creating DCI OPC Server

If you are creating a DCI OPC Server for a Batch System, the following steps must be performed on the individual primary DCI Connectivity Server for each DCI OPC Server.

Create a Symphony DCI OPC Server object by performing the following steps:

1. Open a Plant Explorer Workplace.
2. Use the Structure Selector to select the **Control Structure**.
3. Use the Object Browser to navigate to and right-click `Root Domain` and then select **New Object** from the context menu. The New Object dialog appears.
4. Select the **Common** tab.
5. Expand the following tree:

   `Object Types > Control System > Symphony DCI`
6. Select `Symphony DCI OPC Server Network` from the Symphony DCI tree.
7. Enter a name for the Symphony DCI OPC Server Network and then click **Next**.

8. The Addition Arguments dialog appears as shown in Figure 6. Select **Add**.

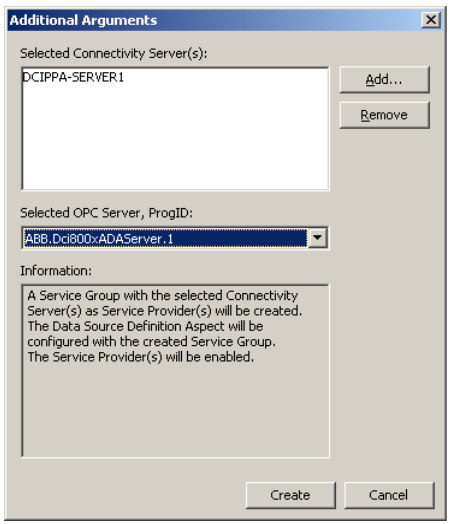

Figure 6. Additional Arguments Dialog

   a. Select the Primary Connectivity Server and Backup Connectivity Server (if applicable) from the list and click **OK**.

9. Select **ABB.Dci800xADAServer.1** from the Selected OPC Server, ProgID drop-down list box and click **Create**.

10. If the DCI Batch system extension has been loaded, the Setup DCI Batch Service Group dialog will appear.

   a. Select **Add** from the Setup DCI Batch Service Group dialog.

   b. Select the Primary Batch Connectivity Server and Backup Batch Connectivity Server (if applicable) from the list and then click **OK**.

11. Verify that the following aspects appear in the Aspect List Area:

   – Control Connection.
   – Control Structure.
   – DCI System Status.
   – DCI Tag Import File Name.

- DCI Tag Import Properties.
- DCI Tag Importer.
- Symphony DCI OPC Server Network Type Reference.
- Name.
- Object Icon.
- OPC Data Source Definition.

12. If the DCI Batch system extension has been loaded, verify that the following aspects appear in the Aspect List Area:
    - DCI Batch Data Source Definition.
    - DCI Batch Connector.
13. Use the DCI Tag Importer to establish all DCI controllers and module tags under the Symphony DCI OPC Server Network. Refer to *800xA for DCI Operation (3BUA000129Rxxxx)* for more details.
14. Some DCI system events will be associated with the DCI Node Name of the Connectivity Server. These events will not be visible unless an Object of the same name has been configured in the 800xA System. The DCI Node Name is the name of the DCI node that appears in a Conductor System Status Display or in the CTK DCU Manager. The DCI Node Name is composed of the Node Number specified at 800xA for DCI installation prefaced with the string `DCI` (Example: `DCI12`). To add the DCI node object:

The DCI Node Name may have a different prefix if 800xA for DCI has been installed along with Conductor NT or Composer CTK.

    a. Right-click the Symphony DCI OPC Server Network Object.
    b. Select **New Object** from the context menu.
    c. Select the **Common** tab in the New Object dialog.
    d. Select `Object Types | 3-rd party OPC server support | Generic OPC Object`.
    e. Enter the DCI Node Name in the Name edit box.
    f. Click **Create**.
15. Repeat Step 3 through Step 14 for each DCI Connectivity Server.

Section 6 Configuring the DCI AE Event Collector Structure

Introduction

This section describes the procedure for configuring the DCI AE Event Collector Structure.

Configuring DCI AE Event Collector Structure

The DCU alarm and event stream is collected by each DCI AE Server on each DCI Connectivity Server node. Every DCI Connectivity Server node collects all alarms and events presented by all DCU nodes that it communicates with.

Place each DCI Connectivity Server node in an Event Collector Service group that covers the same DCU set. The alarms and events are not limited to the set of DCU tag objects configured for the corresponding DA Server. This means that each AE Server that communicates with the same DCU set acts as a backup for each other. Configure a separate Service Provider under a single Service Group for each Connectivity Server node connected to the same DCU set.

Do not configure separate Service Groups for Connectivity Servers that communicate with the same DCU set or duplicate alarms will occur.

Do not add a Connectivity Server as a Service Provider on a Service Group that sees a different DCU set.

To configure the DCI AE Event Collector Structure:

1. Open a Plant Explorer Workplace

2. Use the Structure Selector to select the **Service Structure**.
3. Select the `Event collector, Service object.`
4. Select the **Configuration** tab on the Service Definition aspect.
5. Click **Add** and the New Service Group Name dialog appears.
6. Enter a name, such as `DCI_AE_SGx` (where `x` is a running number), in the edit box on the New Service GroupName dialog and click **OK**. The dialog disappears and the service group name appears in the Groups list.
7. Click **Apply** in the Service Definition aspect.
8. Expand the `Event Collector, Service object` and click the DCI Service Group object.
9. Select the **Configuration** tab on the Service Group Definition aspect.
10. Click **Add** and the New Service Provider Name dialog appears.
11. Enter a name, such as `DCI_AE_SP_`*`nodename`* (where *`nodename`* is a DCI Connectivity Server name), in the edit box on the New Service Provider Name dialog and click **OK.** The dialog disappears and the service provider name appears in the Providers list.
12. Click **Apply** in the Service Group Definition aspect.
13. Select the DCI Service Provider in the Providers list and then click **View**. The Service Provider Definition Aspect View appears.
14. Select the desired DCI Connectivity Node from the **Node** drop-down list box, click **Apply** and then close the dialog.
15. Click the **Special Configuration** tab on the Service Group Definition aspect.
16. Select the `ABB DCI 800xA OPC Alarm and Event Server` from the Alarm Server drop-down list box.
17. Verify that `ABB DCI Alarms and Events` appears in the Collection Definition drop-down list box, then click **Apply.**
18. Verify the connection by clicking the **Status** tab on the Service Group Definition Aspect View and verify that the state is service.

19. Repeat Step 10 through Step 18 for each DCI Connectivity Server node that is connected to the same set of DCUs. Do not create a new Service Group for any of these nodes.
20. Repeat Step 3 through Step 19 for the next set of DCI Connectivity Server nodes that were not previously configured.

Section 7 Control Object Type Definition

Introduction

800xA for DCI uses Object Types to provide a connection to and control of the DCU Controlware modules from the 800xA System. Each DCU module type has a corresponding Aspect Object Type. Module types with multiple Functions (FIXs) have an Object Type for each FIX. The CIO module types (AIO, AIOB, etc.) also have corresponding Object Types.

The following functions are automatically provided by 800xA for DCI:

- Creation of all required Object Types and related Object Type Groups for DCU Controlware modules in the Object Type Structure.
- Creation of all Control Connection Aspect properties for each Object Type
- Creation of a DCI OPC Control Network Object Type. This Network Object Type includes the DCI Tag Importer. Refer to the *800xA for DCI Operation (3BUA000129*)* instruction for more information on the Tag Importer.
- Creation of required Aspect System Objects (ASOs) for the DCI Object Types.

Standard DCU Module Types

An Object Type has been defined for each of the supported module types in DCI. Each module type corresponds to an Object Type as shown in the Object Types structure. A Control Connection Aspect (CCA) exists for each Object Type. The properties included in the Object Types are all those that have DBA access for the given module type and FIX.

CIO Module Types

An Object Type exists in the Object Type Structure for each of the following CIO module types:

- AIO.
- AIOB.
- DIOB.
- XCON.
- XMSG.

Object Types Structure

The Object Types Structure in the Plant Explorer Workplace is where the Object Types are created. The Symphony DCI Controlware Modules Object Type Group resides under the Control System Object Type Group.

CCAs

Each Symphony DCI Module Object Type has an OPC CCA. The CCA lists all of the DBA accessible atoms as properties of the Aspect. Figure 7 shows a sample CCA Property View for an ANI FIX 0 Object Type.

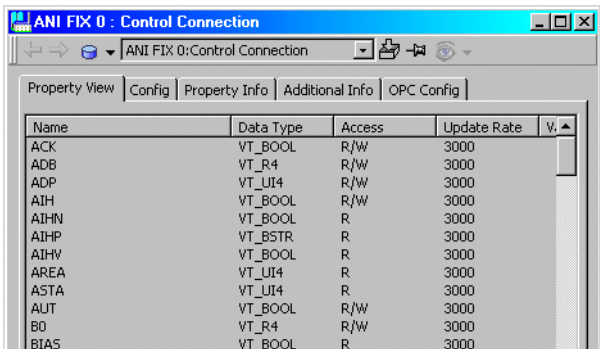

Figure 7. Property View of the Control Connection Aspect

Data Type Conversion

The Data Types assigned to the properties of the CCA are derived from the Data Types stored in the Composer CTK project databases. The Composer CTK data types are derived from the types stored in the DCUs ALD format. The ALD types are in turn derived from the DCUs Data Dictionary Data Types.

Table 3 and Table 4 show the conversion from DCU Data Dictionary Data types to the CCA property Data Types.

Table 3. Data Types 1

DCU Data Dictionary Type	Composer CTK Data Dictionary Type	DCU Data Dictionary Type	Composer CTK Data Dictionary Type
UD	NULL	TO	TM
BI	BOOL	SY	TM
TI	INT:1	MD	PTR
UT	UINT:1	PT	NULL
CO	UNT:2	GD	GD
US	UINT:2	CD	CD
LO	INT:4	SU	TEXT
FL	FLOAT:4	DP	NULL
DO	FLOAT:8	BA	BOOL
TX	TEXT	MP	MP
ST	TEXT	BB	BOOL
B8	BITS	XD	PTR
B16	BITS	BIA	BITS
B32	BITS		

Table 4. Data Types 2

Composer CTK Data Dictionary Type	Process Portal Variant Type	Composer CTK Data Dictionary Type	Process Portal Variant Type
TEXT	VT_BSTR	BITS:1	VT_UI1
INT:1	VT_I1	BITS:2	VT_UI2
INT:2	VT_I2	BITS:4	VT_UI4
INT:4	VT_I4	GD	VT_BSTR
UINT:1	VT_UI1	CD	VT_BSTR
UINT:2	VT_UI2	TM	VT_DATE
UINT:4	VT_UI4	MP	VT_BSTR
FLOAT:4	VT_R4	BIT	VT_BOOL
FLOAT:8	VT_R8	TG	VT_BSTR
PTR	VT_BSTR	NULL	VT_EMPTY
BOOL	VT_BOOL	DYN	VT_EMPTY

Array Handling

Some Symphony DCI Controlware atoms are defined as arrays. These atoms appear in the CCA with a data type of either VT_BSTR|VT_ARRAY or VT_VARIANT|VT_ARRAY.

Object Type Definition for Symphony DCI OPC Control Network

This Object Type is a specialization of the Generic OPC Server Network Object Type. Its aspects include the DCI Tag Importer which is the uploader for the tags.

Section 8 Security

Introduction

GDBA write security is a function of the controller. GDBA write security is maintained on an Area basis and an access level. There are up to 255 areas in a DCI installation, and there are nine access levels as defined in Table 5.

Table 5. Symphony DCI Access Levels

Level	Trust	Level	Trust
Operator 1	1 (low)	Engineer 3	6
Operator 2	2	Supervisor 1	7
Operator 3	3	Supervisor 2	8
Engineer 1	4	Supervisor 3	9 (high)
Engineer 2	5		

Operator Level 1 is considered the lowest and least trusted level, while Supervisor Level 3 is the highest and most trusted level. Each level is a super set of the preceding level in terms of allowed access and trust. Beyond that, the actual implementation and use of the access levels is user designed and user specific.

Areas and access levels are fundamental to DCI security and must be preserved. Refer to the *Controlware II Module Reference (3BUA000313*)* instruction for information and detail concerning the dynamics of security in the DCU.

DCI Security

Each user login is assigned one of the nine access levels in Table 5 and anywhere from 1 to all 255 areas. The assignments are made when the user login is configured and may be modified by the customer when the need arises.

Each GDBA writable atom in each DCU module has an assignable write access level from Table 5. Access level assignment is a function of the DCU Data Dictionary. Also, each individual DCU module is assigned to a specific area as defined by the AREA atom. However, areas are dynamic and may be changed as part of the security for a control algorithm.

Each individual atom write request is checked to see if the AREA of the atom is set in the area mask, and if the access level of the atom matches that in the transaction. Only those that match are permitted. If any write request does not match, the overall transaction status is marked as containing errors, and the individual write request is marked as failed due to a security violation. It is left to the originating application to deal with the transaction status. In the case of a display, such as a point or graphic display, an error indication pops up with a text message describing why the transaction failed.

Symphony DCI users have the flexibility to design the security within these parameters and that it is vital to preserve the current functionality. The console does not have the ability to predict or track the dynamics of AREA manipulation as performed by Controlware. Security control must still be done within the DCU.

800xA System Security

800xA System security is an adjunct to Windows Server 2008 security and is achieved by association with Windows Server 2008 groups. The initial installation of 800xA System creates five Windows groups automatically, which are intended to provide levels of security and trust. The five groups and their intended usage are shown in Table 6 (refer to the *System 800xA Administration and Security*

(3BSE037410)* instruction for more information).

Table 6. Industrial IT Windows Server 2008 User Groups

800xA Group	Recommended Usage	DCI Approximation
IndustrialITAdmin	Configure Admin. Structure.	None.
IndustrialITUser	Read.	Operator 1.
IndustrialITOperator	Read and operate.	Operator 2.
IndustrialITApplicationEngineer	Read, Operate, Configure, and Tune permission.	Operator 3 to Engineer 3.
IndustrialITSystemEngineer	Read, Administrate, Security Configure, and Configure permission.	Supervisor1 to Supervisor 3.

NOTE: All users must be added to the IndustrialITUser group.

Composer CTK Security

Some of the Composer CTK features are restricted by access rights that are associated with the CTK login. The following table (Table 7) shows the access rights required to use each CTK feature:

Table 7. CTK Security

CTK Feature	Administrative Rights	Online Configuration Rights	Database Transfer Rights
DCU resident configuration	—	Read/write	—
DCU resident service	—	Read/write	—
File download (Send To DCU button)	—	—	Upload/download
File upload (Get From DCU button)	—	—	Upload/download
DCI System Security	Administrative	—	—

800xA for DCI Firewall Configuration

On all 800xA for DCI Connectivity Servers, run Windows Firewall Configuration and use the following procedure to add 800xA for DCI tasks to the Windows Firewall exception list.

1. Open the Windows Control Panel.
2. Open the Windows Firewall configuration window.
3. In the Windows Firewall window, click **Allow a program through Windows Firewall**.
4. In the Windows Firewall Settings dialog, select the **Exceptions** tab, if not already selected.
5. Click **Add Programs...** to view the **Add a Program** dialog..
6. In the **Add a Program** dialog, click **Browse...**, to locate the DCI Network tasks, usually the location would be, ***C:\ABB\bin***.
7. Click **AbbDciNetRouter.exe** in the list of executable objects, and then click the **Open**. The Browse dialog disappears.
8. Click **OK** in the **Add a program** dialog. The Add a program dialog disappears and the AbbDciNetRouter.exe object appears in the list of programs in the Windows Firewall Settings programs with the check box selected.
9. Repeat Step 5 to Step 8 for **tsyncdd.exe**, **tsyncCtrl.exe**, and **tftpd.exe**.
10. Click **Apply** and then click **OK** on the **Windows Firewall Settings** dialog. The Windows Firewall Settings dialog disappears.
11. Close the **Windows Firewal**l window.
12. Close the **Control Panel**.
13. Reboot each 800xA for DCI Connectivity server when the Windows Firewall configuration is complete.

800xA for DCI and IPSec

The following procedure is only done on domain controllers.

The use of IPSec in 800xA must be addressed for 800xA for DCI Connectivity Servers and the HDCU controllers on their control networks. IPSec restricts the node access to an 800xA system within a domain environment. The restriction extends to all nodes, including HDCU controllers, thus, IP addresses for all HDCUs must be entered using the IPSec tool.

DCI redundant controllers are referred to as “a” and “b” units for the right and left DCP. When running, one of these units will become the online unit and the other will become the backup unit. Both the “a” and “b” units must have their IP addresses added to the IPSec rules for exemption.

Follow the instructions on using the ABB 800xA IPSec Configuration Tool. When ready to proceed with entering the IP addresses of the DCI HDCU controllers, select the *Add Exemptions for 800xA DCI HDCU Controllers* in the **Exemptions List:** combo-box control.

Add the IP addresses for each HDCU one at a time in the **Subnet or IP addresses:** text field and click **Add Exemptions** to add to the exemptions list. Add the IP address of both the “a” and “b” units.

Section 9 Administration

Introduction

This section describes the procedure for configuring the Users and Security settings.

Configure Users and Security

Refer the *System 800xA Administration and Security (3BSE037410*)* instruction for more detailed information. Configure the Users and Security using the following steps:

1. Assign Microsoft® users.
2. Assign Security Settings in the **Administrative Structure > Domains > *<computer name>* > System Domain** according to the 800xA System documentation and assign the Security Settings.
3. Use the Configuration Wizard to associate 800xA System groups to Microsoft groups.
4. Use the Configuration Wizard to assign users to the groups in the user structure (Operator to Operators group).

Index

Numerics

800xA for DCI
    Symphony DCI OPC server object 27

A

Advanced tab
    Tag importer 20
Assign microsoft users 45

B

Batch 19
Batch extension 19
Batch for DCI 19

C

Composer CTK 15
    Description 15
    Overview 13
    Reference instruction 13
    Security 41
Conductor NT
    Synchronization 24
Conductor UX
    Synchronization 24
Configuration wizard 45
    Group association 45
Controller modules 35

D

Data access interface
    DCU 23
Data types 37
DCI access levels 39
DCI OPC control network object 35
DCU 35
    Data access interface 23
    Time synchronization 24
DCU module types 35
Description
    Composer CTK 15

E

Extension
    Batch 19

F

Functional description 13

H

Harmony OPC server
    Users and security 45

M

Microsoft users 45

N

Network service names 25
Network services 23, 25

O

Object type structures 36
Object types 35
Object types structure 36
OPC server object, Symphony DCI 27
Overview
    Composer CTK 13

P

Product overview 13

R

Related documentation 13, 35, 39, 41, 45

S

Security 39
    Composer CTK 41
    DCI access levels 39
    Windows 40
Structure
    Object types 36
Symphony DCI OPC server object 27
Synchronization
    Conductor NT 24
    Conductor UX 24

T

Tag importer 17
    Advanced tab 20
    XML file 18
Time synchronization
    DCU 24

W

Windows 40
    Security 40

X

XML file 18, 20

Revision History

Introduction

This section provides information on the revision history of this User Manual.

The revision index of this Configuration Manual is not related to the 800xA 5.1 System Revision.

Revision History

The following table lists the revision history of this User Manual.

Revision Index	Description	Date
-	First version published for 800xA 5.1	June 2010
A	Second version published for 800xA 5.1 Rev A	May 2011
B	Third version published for 800xA 5.1 Rev E	July 2015

Updates in Revision Index A

The following table shows the updates made in this User Manual for 800xA 5.1 Rev A.

Updated Section/Sub-section	Description of Update
Section 4 Network Services	Added *Time Synchronization of DCU* subsection.
Section 5 Creating DCI OPC Server, *Creating DCI OPC Server* subsection.	Added a **Caution** Note.

Updated Section/Sub-section	Description of Update
Section 8 Security	Added *800xA for DCI Firewall Configuration* subsection.
Section 8 Security	Added *800xA for DCI and IPSec* subsection.

Updates in Revision Index B

The following table shows the updates made in this User Manual for 800xA 5.1 Rev E.

Updated Section/Sub-section	Description of Update
Section 1 Introduction	Product Overview

Contact us

www.abb.com/800xA
www.abb.com/controlsystems

3BUA000135-510 B

Power and productivity
for a better world™