System 800xA
800xA for Freelance
Product Guide
System Version 6.0
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Section 1  Overview

Introduction

The Connectivity software 800xA for Freelance and standard OPC® provide a connection between the control level established with 800xA-System operator workplaces and Freelance control.

Figure 1. System Overview
Features

Using interactive process graphics, the operator can monitor and control all analog loops and digital devices interfaced to the network through Freelance controller. It also serves maintenance personnel to globally monitor the operating status of the process and associated devices.

The upload of engineering data to **800xA-Operation** and communication through standard OPC interfaces are the major features. Below is a brief summary:

- Provides object types for Freelance function blocks and variables
- Support of user defined function blocks and structured variables
- Various aspects for object type: Faceplate, alarm list, event list, control connection etc.
- 800xA-System like faceplates for continuous control, drive control etc. are available by default.
- SFC viewer aspect for visualizing structure, steps, transitions and actions in combination with a sequence control.
- Data access to process data and hand-over of alarms/events via OPC
- Default mapping table for harmonizing property names and alarm priorities
- Co-existence of connect services in the same 800xA System
- Object instantiation in 800xA-System plant explorer by means of the pre-defined object types
- Object tree within the control structure and functional structure
- Load sharing for large projects by supporting multiple single/redundant OPC server
- Creation and grouping of plant areas (Freelance => 800xA) in the functional structure
- Supports extended PLCopen® compliant export file (.ple)
- Option for delta upload and synchronize mode
- Supports New Graphics for System 800xA (based on .Net and WPF which is the latest MS technology for graphics).
For controller faceplates, Tuning and PID parameter tabs have been added. The parameters can only be modified by advanced users. Operators have read-only access.

Additional engineering effort and software might be needed in order to support Core Functional Areas other than 800xA Operation. Such areas are for instance Production Management (Batch), Asset Optimization and Information Management.

Regarding Production Management please contact the Lead Center Chemical Germany for provision of the required System Extension.
Co-existence of Connect Services

800xA for AC 800M, 800xA for AC870P and 800xA for Freelance connect services are allowed to co-exist simultaneously in the same 800xA system.

Below the typical installation layout with dedicated connectivity servers for best performance. The example shows three different plant areas that are co-existing for common operation and visualization.

Figure 2. Dedicated Connectivity Server

Dedicated Connectivity Server are mandatory.

Multi System Integration

800xA for Freelance can be configured and run on 800xA Multi System Integration environment using the following ways:

- As a Remote Access Server to act as a provider for a remote Client System.
- As a Remote Access Client to act as a client for a Remote Server.
Faceplates

The Connectivity software package provides a default set of faceplates with System 800xA look and feel. All faceplates are subdivided into dedicated areas for information (header), alarming, value display, and operation. Faceplates with a [ooo] button can be enlarged to show a small trend display. The language for all human readable outputs of the Connectivity software (faceplates, dialog boxes etc.) depends on the operating system language (regional settings). English and German language are supported by default.

Figure 3. Subset of Available Faceplates
The SFC object type features the SFCviewer aspect for visualization of transitions, actions and steps in addition to the usual faceplate.

Figure 4. Sequential Function Chart SFC
Alarms and Events

Object types are used for controlling and monitoring function, so all instances bear an alarm list and an event list by default. The lists present status information, process alarms, system alarms and more. Customer-specific color settings for the lists can be achieved by using a modified color schema.

Higher-ranking objects in the control structure display a collection of all alarms and events. The same applies to higher-ranking objects in the functional structure, provided that they offer such an aspect too.

Example: CBF project node

Figure 5. Alarming and Events
Structures

The uploader establishes two different structures (views) at the plant explorer workplace. The control structure shows the Freelance network, projects, gateways and hardware whereas the area structure deals with user-defined groups (e.g. Unit 1 to Unit 4) and assigned plant areas.

Figure 6. Structures
Prerequisites and Requirements

The connectivity software requires the below stated Windows operating systems:

- Windows 2012 R2 Server Standard edition with Service Pack 2
- Windows 8.1 Enterprise edition

The Connectivity software version 6.0 was developed, tested and released on basis of:

<table>
<thead>
<tr>
<th>System 800xA, Operation</th>
<th>SV6.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freelance</td>
<td>Freelance 2013 RU1</td>
</tr>
</tbody>
</table>

Associated service packs, hotfixes, rollups and security patches have to be installed. Refer the Release Notes and Installation Instructions prepared for System 800xA Operation, Freelance and the Windows operating system.

For PC hardware requirements, refer the corresponding user guides for the 800xA-System and Freelance. Make sure your computers fulfill these requirements.

The use of the Connectivity software 800xA for Freelance requires OPC for Extended Automation (B050) licenses according to the price list:

- 2PAA108540, Freelance 2013 - Base License
Sizing Details

The details for sizing purposes are listed in Table 1. The performance that can be expected regarding the OPC throughput and upload rate is basically determined by the server PC hardware. The performance of data sources like controllers, field devices etc. is also very important.

Table 1. Sizing Details

<table>
<thead>
<tr>
<th>Subject</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of 800xA CS objects in a Freelance project</td>
<td>Max. 4 CS objects per Freelance project.</td>
</tr>
<tr>
<td>• A CS object represents one OPC gateway, or two</td>
<td></td>
</tr>
<tr>
<td>in case of redundancy.</td>
<td></td>
</tr>
<tr>
<td>• Four CS objects correspond to 4(8) OPC</td>
<td></td>
</tr>
<tr>
<td>gateways.</td>
<td></td>
</tr>
<tr>
<td>Number of Freelance OPC gateway instances running on a</td>
<td>Max. 3 OPC instances may run on a Server PC.</td>
</tr>
<tr>
<td>Connectivity node.</td>
<td></td>
</tr>
<tr>
<td>• Install the Freelance OPC gateway software on Connectivity nodes, only.</td>
<td></td>
</tr>
<tr>
<td>• To ensure the required performance, exclusively use the</td>
<td></td>
</tr>
<tr>
<td>Freelance OPC gateway software on that PC.</td>
<td></td>
</tr>
<tr>
<td>800xA tags per Connectivity server</td>
<td>Typ. 10,000 OPC items / s</td>
</tr>
<tr>
<td>• provided the subscription rate is $\geq 1$s</td>
<td></td>
</tr>
<tr>
<td>• 10,000 OPC items/s correspond to 2000 tags/s</td>
<td></td>
</tr>
<tr>
<td>• $\geq 1$ OPC gateway instance running on a Connectivity server requires sharing of the specified tag/s count.</td>
<td></td>
</tr>
<tr>
<td>• For $\geq 10,000$ items/s, add additional connectivity servers.</td>
<td></td>
</tr>
<tr>
<td>Upload rate to the aspect directory.</td>
<td>Typ. 1s / tag</td>
</tr>
</tbody>
</table>

More than one OPC instance on a Connectivity Server PC does not increase the specified OPC data throughput, as the PC performance remains constant.
Subscription Rate

The subscription rate (OPC items/s) defines the number of Connectivity Server PCs you need. Process graphics and historian logs are the most important subscribers. Compared to this, subscription by faceplates and online trends is negligible. Do not confound the overall number of tags/variables engineered for a Freelance project with the 800xA subscription rate (OPC items/s).

To get an estimation of the subscription rate, you need at least the below-listed project data. The numbers in brackets are used for exemplary calculation.

- Number of clients/screens (C = 10)
- Average number of OPC items used for a process graphics (I₁ = 50 tags x 5 items)
- Signals used for continuous archiving (I₂ = 200 items)

**Assumptions:**
- Signal update every second

**Exemplary calculation:**

\[ C \times I₁ + I₂ = 10 \times 250 + 200 = 2700 \text{ OPC items/s} \]

This example is a rough indication for calculating the OPC load. Calculation for the specific Freelance project is recommended for sizing the Connectivity node(s).

Assignment of CS Objects and OPC Gateways

The assignment of CS Objects, OPC Gateways to Connectivity Nodes/Server may differ depending on the project size, number of projects and performance requirements. The below examples are intended for giving an idea of the possible configuration. Combinations are allowed.
Example 1: Economic

Sharing of 1(2) Connectivity server(s) for three small Freelance projects would give an economic configuration. Please note the reduced subscription rate for a project.

Figure 7. Economic
Example 2: Typical

1(2) Connectivity server(s)/node(s) providing a subscription rate of 10,000 OPC items/s for each project.

Figure 8. Typical
**Example 3: Extended**

4(8) Connectivity servers/nodes providing a high subscription rate of 40,000 OPC items/s for a single project.

![Diagram showing extended connectivity servers/nodes](image)

- **CS1**: OPC1/OPC2
- **CS2**: OPC3/OPC4
- **CS3**: OPC5/OPC6
- **CS4**: OPC7/OPC8
- **Max. 12(24)** Connectivity Nodes with SV5.0

**Figure 9. Extended**
800xA Tag Count

800xA Operation counts each tag (function block and variable) that provides a faceplate aspect. Without any measures, all tags of a Freelance project will be uploaded to 800xA Operation, even if many of them are not required for operation, process graphics, online trending, archiving or other purposes. In order to reduce the tag count please note the following details.

New Freelance Project

- Before engineering a Freelance project, exclude all tags and variables from OPC data access (uncheck Read/Write check box).
- In the final step of the engineering work, set OPC attributes to RW only for those tags that are required for operation, process graphics, trending and archiving. This applies in general to function blocks like IDF, C_CU, M_ANA and M_BIN for individual control and monitoring. You may sort out those function blocks using the filter option in the station access view.

In System 800xA most signals can be accessed by using “tag.signal” instead of using discrete variables in the Freelance project. The control connection aspect of the object type displays the available signals.
Existing Freelance Project

- Deletion of the OPC RW attribute in the Freelance project is recommended. This reduces the OPC load and remains effective even after a Connectivity software upgrade. Select Synchronize mode in order to update the aspect directory.

- Deletion of the faceplate aspect or inherent attribute on the object type is an alternative solution. This measure has to be repeated after a Connectivity software upgrade.
Section 2 Ordering

Price Book Structure

The price book 2PAA102059 includes the price list for ordering the latest version of the connectivity product.

**Price List: 800xA 6.0 for Freelance, 2PAA113111**
Contains details regarding the base license

Ordering details

800xA Operations connectivity may be used with one or more Freelance installation.

Use of the Connectivity software **800xA for Freelance** demands following items from Freelance price list

**For Freelance 2013 version,**

“Freelance 2013 - Base License” of Freelance 2013 (2PAA108540):

- “Control Builder F Standard, SW License” (item D110) or
- “Control Builder F Professional, SW License” (item B121)

with below additions:

+ OPC for Extended Automation”, item B050”
Base License

Please select the following license item for your order.

B010  800xA 6.0 for Freelance (2PAA101176R4)
Order one license per 800xA system. The number of connectivity servers and gateway (OPC) instances is irrelevant for the licensing issue.

B020  Add to existing Software Subscription (3BDS008515R08)
When ordering a Connectivity license for an already existing 800xA System, reference must be made to the present system in addition to B010. Indicate the System ID.

Symbol Factory Controls are no longer installed with the standard ABB 800xA Installation. 800xA for Freelance requires Symbol Factory Controls to be installed. The ABB 800xA Symbol Factory installation package is available in the media. A separate license PG2_SYMBOLFACTORY_CONTROLS is required to use the ABB 800xA Symbol Factory Controls.
Ordering Example

Example: One or more existing Freelance installation can be combined with one System 800xA Operation.

First specify the Connectivity product licenses (B010) that enables Freelance for cooperation with System 800xA.

<table>
<thead>
<tr>
<th>Product</th>
<th>Ordering number</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>800xA 6.0 for Freelance</td>
<td>2PAA101176R4</td>
<td>1</td>
</tr>
</tbody>
</table>

Secondly specify the association of the license (B020) to the 800xA system. Enter existing System ID.

<table>
<thead>
<tr>
<th>Product</th>
<th>Ordering number</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Add to existing Software Subscription</td>
<td>3BDS008515R08</td>
<td>1</td>
</tr>
</tbody>
</table>

From SV6.0, 800xA for Freelance software and documentation are included as part of System 800xA Media System 800xA Expansion Price List (3BSE073828*).