

This is the way they can guarantee that project and planning engineers as well as the operation staff apply uniform standards for the design and implementation of automation technology systems.

## PC Toolkit Library for AC 800M Controller

The PC Toolkit Library for AC 800M is a system extension for System 800xA. With the PC Toolkit Library for AC 800M, each customer is assured that the same functional solutions are implemented worldwide. That results both in simplified maintenance of the automation system and in cost savings with new installations and their commissioning.

- Standardized ready-to-use workplace
- Standardized Control Module Types (CMT) for process functions like motors, valves, counters, controllers, etc.
- Faceplates for the operation of the individual function
- Graphic elements for setting up process graphics
- Set of pre-configured Function Designer typicals which meets the requirements for process industry
- Interlock display which shows the binary incoming interlock and priority command criteria
- 800xA Batch management connection to AC 800M controller with Function Designer using the PC Batch Library and the EPI Phase Driver
- PC Tools which facilitates interoperability configuration through the automated generation during engineering

# PC Operator Workplace

The PC Operator Workplace is a ready-to-use workplace that extends the standard operator workplace in many aspects.

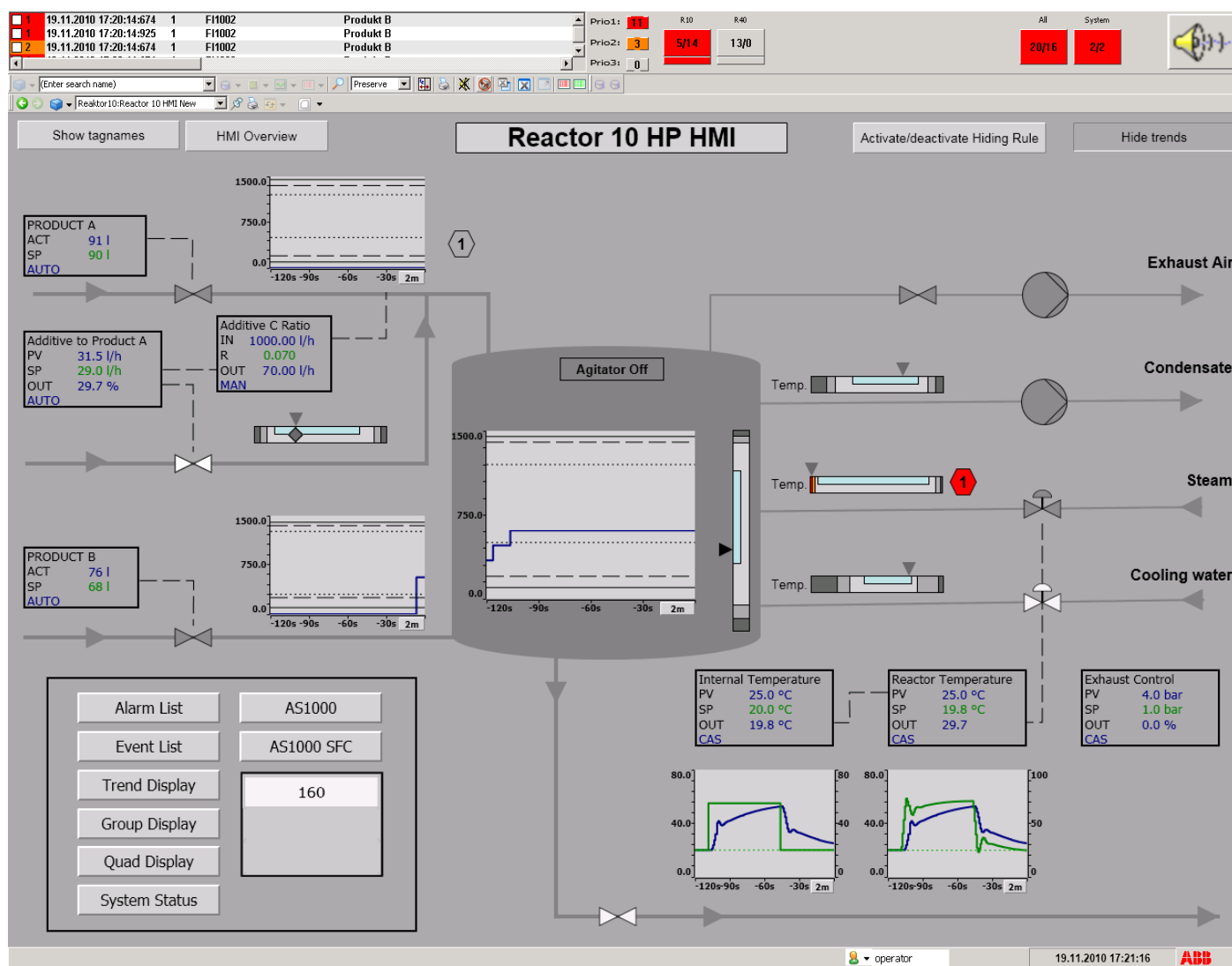
It has a preconfigured layout (e.g. for the application bar) which can easily be modified to fulfill the project requirements.

Furthermore it provides a preconfigured layout for one or two monitors. All settings of the workplace (e.g. at which position on the screen a faceplate window will appear) are preconfigured for the usage of faceplates provided by the PC Toolkit Library.

Preconfigured workplace features:

- Operator workplace layout for one or two monitors
- Alarm- and event list configuration
- Trend template for operator trends
- Workplace settings (e.g. object selection frame)
- Two user groups (advanced operator, instrumentation and electrical personnel)
- Pre-configured shortcuts

## (1) PC Operator Workplace



## Control Modules

Control Module Types (CMT) form the core functionality of a process function like motor, valve, controller, dosing, analog/binary input etc. The Control Module Types of the PC Library are based on the 800xA standards CMT library but customized in order to meet the requirements of the process industry. Each CMT has its own faceplate.

The PC Library provides control module types for:

- Analog input
- Dosing
- Flags
- Motors (one direction, two direction/speed) and variable frequency drives (VFD)
- PID controller, PID master for cascade controller, split-range controller
- Totalizer
- Valves (on/off, three way)
- PROFIBUS devices (e.g. ACS 800, UMC100)
- Auxiliary control modules

## Faceplates & graphic elements

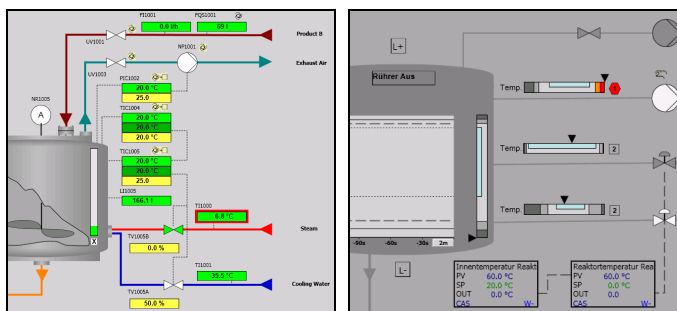
### Classic and high performance indication

The user has the choice to use graphic elements or faceplates in a classic or high performance style.

High Performance HMI expands the capabilities of traditional HMIs of distributed control systems in many aspects.

It reduces risks of human errors and decreases operator-related incidents by improving situation awareness and leading to better handling of abnormal conditions. Using High Performance HMI can help operators to make better decisions and so improve process safety and process uptime.

Some of the main factors to improve the classic HMI are deliberate color definitions, usage to maximize visibility of abnormal situations and reduced complexity. A new style for alarm indications can be used in faceplates and as graphic elements.



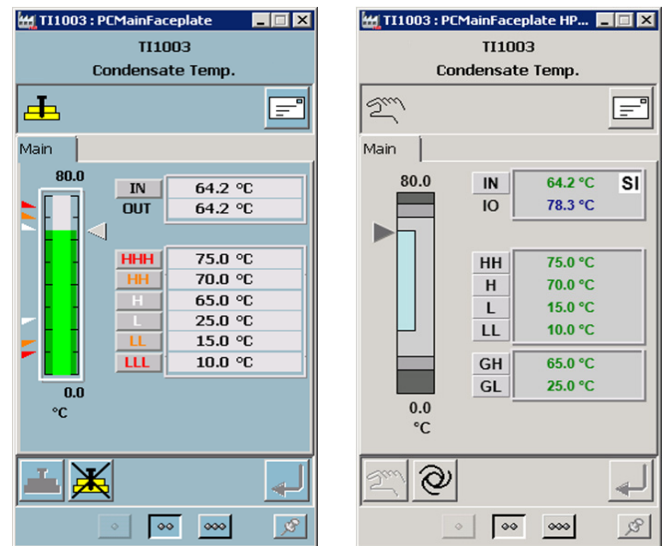
(2) Classic & High Performance HMI example

Figure (2) shows the differences of the color definitions, graphic elements and how High Performance HMI can be used to increase the visibility of an abnormal situation.

High Performance HMI does not only mean the usage of gray scales but also a modified way to display information (e.g. using bargraphs instead of numeric values when it makes sense). Another difference to classic HMI is the usage of color changeover (e.g. for limit values in bargraphs).

## Faceplates

Figure (3) shows the comparison of an analogue value faceplate in classic and a High Performance HMI style.

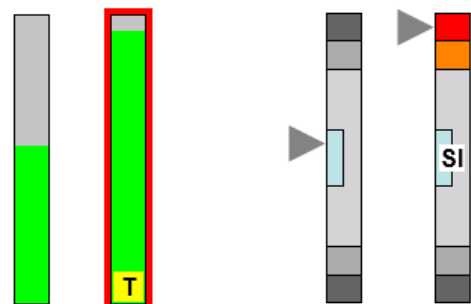


(3) Classic & High Performance HMI faceplate

As shown in the screenshots the classic analog value faceplate has three limit value pairs whereas the HP HMI faceplate has two limit value pairs and in addition a range pair commonly known as good range (or operating range) which gives the operator the possibility to recognize if the measured value leaves the normal range before the occurrence of an alarm.

## Graphic elements

Figure (4) shows the comparison of an analog value bargraph in classic and High Performance HMI style. In both cases a bargraph in a normal process situation and in an abnormal situation is shown.



(4) Classic & High Performance HMI graphic element

In the abnormal situation an alarm limit is reached:

- Classic HMI: red alarm frame
- HP HMI: color changeover

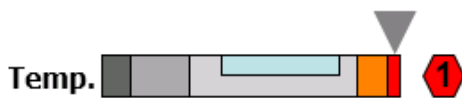
and the value is forced:

- Classic HMI: black 'T' on yellow background
- HP HMI: black 'SI' on white background.

## Alarm indication

The alarm indication graphic element provides information of the most important actual alarm. Active alarm state is shown by different shapes and colors so the operator can easily recognize the alarm priority.

Figure (5) shows a bargraph graphic element with an additional alarm indication.



(5) Bargraph with additional alarm indication

Figure (6) shows the different alarm shapes for the alarm priorities. The priority of an alarm can be recognized by the color of the alarm shape, by the priority number in the shape and also by the shape type.



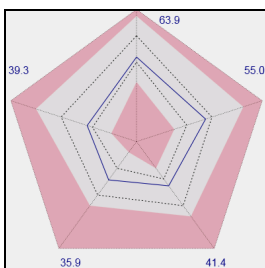
(6) Alarm shapes for different alarm priorities

## Free graphic elements

Free graphic elements are universal to use. The usage is independent from the control module type. When configuring the graphics each signal for actual value, ranges and limits is connected separately. This gives possibility to use any module type supporting analog value monitoring (typically an analog input module or PID module).

## Radar diagrams

The purpose of a radar diagram, see figure (7), is to give a quick overview of several analog values in one element.

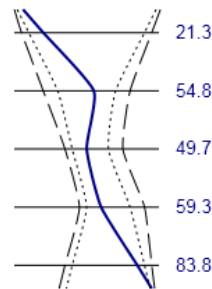


(7) Radar diagram with 5 spokes

## Profile indication

The purpose of profile indications, see figure (8), is to give a quick overview of several analog values (e.g. temperatures, pressures in different areas of a tank). There exist two similar predefined HP HMI elements:

- Profile indication element shows the limits as single lines
- Profile indication map element shows the limits as curves

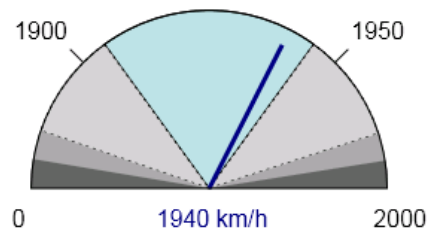


(8) Profile indication

## Voltmeter

This element provides information about the actual value, alarm limits and normal value range in a voltmeter style layout. The value is presented by an indicator and optionally by a numeric value text.

A half-circle indication area is split into multiple arcs. Each arc represents one of the limits similar to the bargraph indication. The limit areas change their color in inactive and active state.



(9) Example of a voltmeter indication with active magnifier

As shown in figure (9) an additional magnifier function allows to extend the display for a defined range with a defined start and end angle to highlight the interesting section of the complete measuring range.

# Typicals and Interlock Display

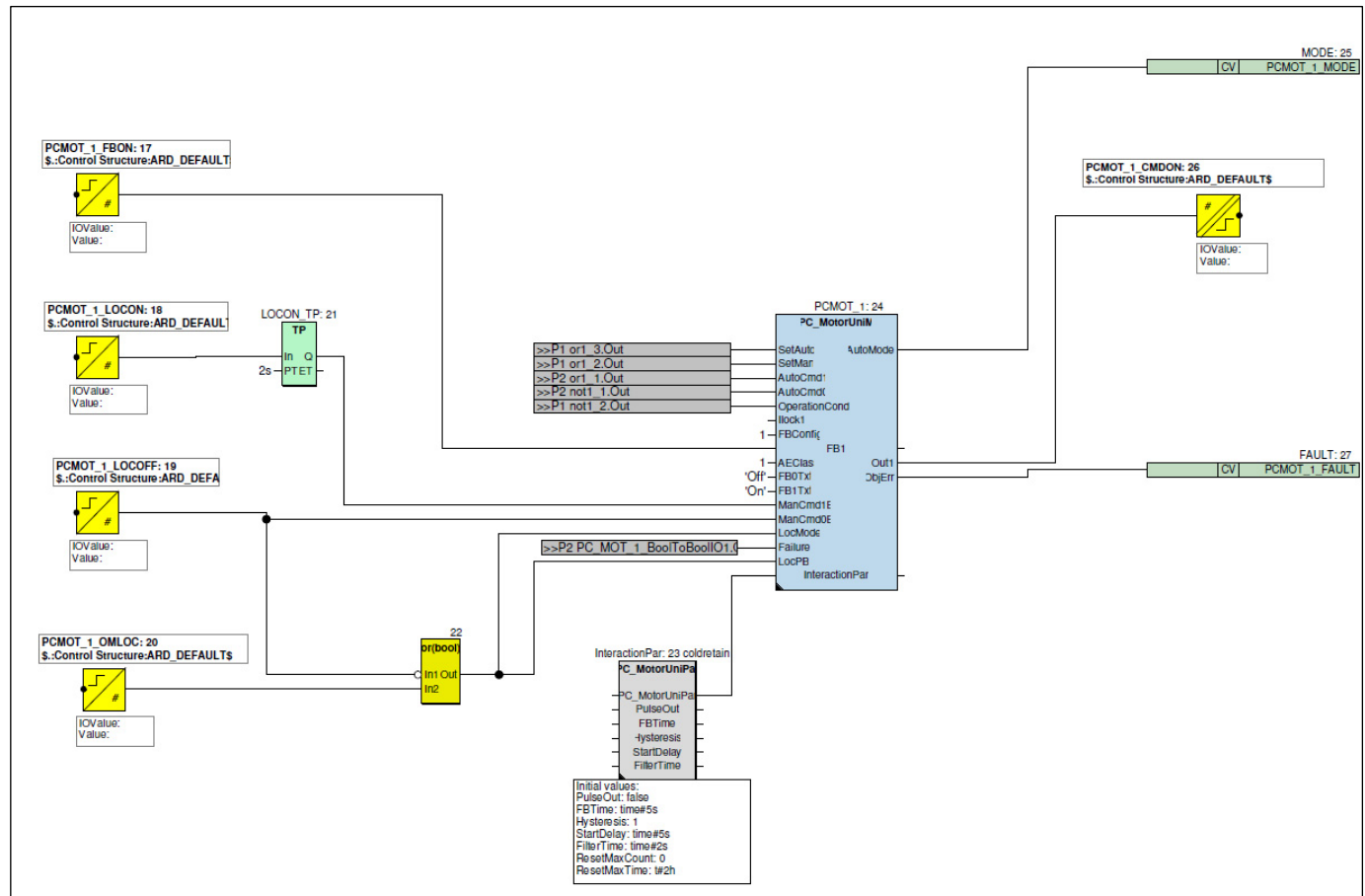
A function typical, see example figure (10), is a ready-to-use template containing the Control Module Type as core functionality, supplement logic modules and connection to hardware input and output components.

The PC Toolkit Library for AC 800M software package provides a well tested set of typicals, customized to meet the requirements of the process industry.

The templates are based on the 800xA Function Designer. The typical can be copied and parameterized via bulk functions. Efficient engineering is granted.

A double mouse click on a signal in the table or logic view opens the default aspect (normally the faceplate) of the signal origin.

(10) Example of a function diagram typical

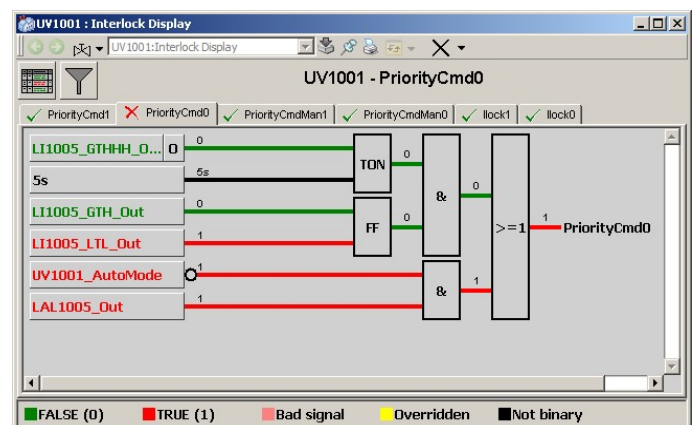


## Interlock display

The interlock display is an aspect type and shows the binary incoming interlock and priority command criteria for the selected object types e.g. motor. Depending on the status of the variable, criteria that are met are shown in green and criteria not met are shown in red. Priority and interlocking parameters can be used to control the behavior of the process objects in certain situations, for example, stopping an object from running into a certain state or forcing it into a certain state.

Depending on a global setting the interlocks can show either open or closed circuit principle.

The interlock display has two views to display the interlocks, a table view and a logic view. Also a filter option is available.



(11) Interlock display - logic view showing the open circuit principle

# PC Batch Library and EPI Face Driver

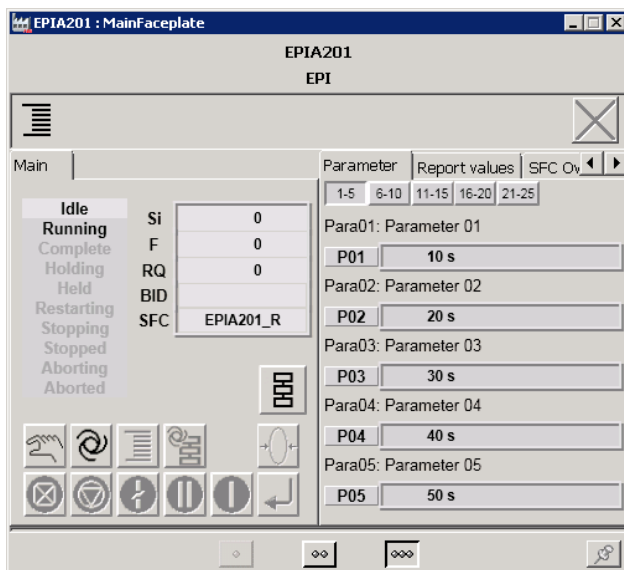
The PC Batch Library provides control module types and faceplates in order to configure the batch functionality for equipment phases on AC 800M Controller with Function Designer technology. The main CMT is the equipment phase interface (EPI). The EPI block has the task of implementing the commands from a recipe package and the recipe parameters, dispatching requests and returning current states and error codes.

Main features:

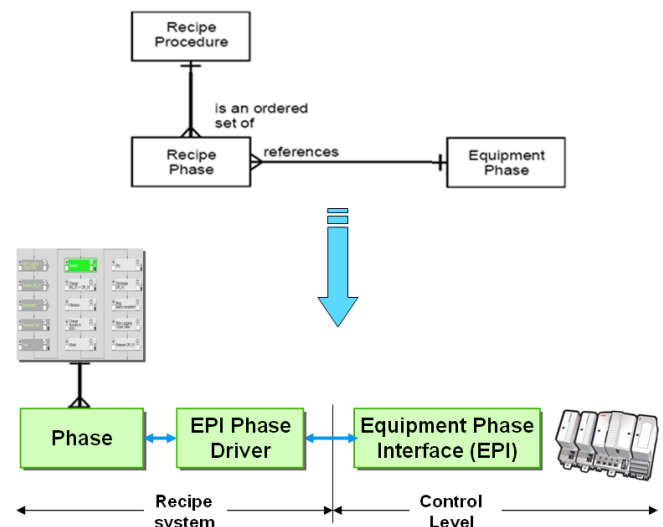
- EPI provides the ability to connect different recipe packages, like 800xA Batch Management, Workflow Manager Batch Control Module, or other 3rd party recipe systems.
- Without using recipe package, EPI can work as SFC supervisor module to control a SFC and handle assigned parameter.
- The PC Batch Library includes control modules, faceplates and connectors for an easy connect of phase SFC's, phase parameters and phase report values.
- The EPI state machine is in compliance with ISA-88.01.

The EPI realizes equipment functionality. It can handle parameter values, report values and up to 5 assigned SFC's, each of it for the different ISA-88.01 state running, hold, restart, stop and abort.

- Up to 35 phase parameters for each phase can be handled including phase parameters of type string.
- Easy handling and configuration.
- Automatic generation of the EPI faceplate in 800xA includes references to the parameter, report values and SFC's and jump buttons.



(12) EPI faceplate



(13) From theory (ISA-88.01 Figure 17b) to practice in 800xA

## EPI Phase Driver

The EPI Phase Driver connects the 800xA batch management to the EPI control module on an AC 800M controller with Function Designer. It provides functionality like:

- Reporting
- Transfer of control (TOC)
- Parameter management
- ISA-88.01 state management

EPI Phase Driver supports the 800xA Batch management and complements the following additional features

- Allows simple and fast engineering of the application.
- Reading report value and generating tag data in unique type references to generate batch reports with BatchReportXL.
- Enables the configuration of simple recipe structures in order to write new set point values into a running phase (TOC) e.g. for flexible set point ramping.

# PC Tools

PC Tools facilitates interoperability configuration through the automated generation during engineering. The functionality includes:

## Aspect Link

Aspect Link adds multiple aspect references to its objects context menu. Aspect Link is an aspect that allows to manually configuring additional links to any object aspect of the same or different objects.

## SFC Step Text Uploader

For the graphic element types, which display the active step of a sequence (SFC). The tool generates a list that maps the SFC step number and the SFC step text.

## Interlock Display Uploader

The interlock display shows the binary incoming interlock and priority command criteria for the selected motor or valve object type. Depending on the status of the variable, criteria that are met are shown in green and criteria not met are shown in red.

## Link Generator

- Faceplate, trend and group display links

The tool analyses the selected objects of the functional structure. The tool adds aspect links to all other objects with faceplates that are inserted under the same Function Designer diagram object.

- SFC Viewer links

The tool adds the aspect link to the appropriate SFC viewer aspect, that is located a level above each SFC header object of the selected object tree.

- User-defined links

The tool adds user defined links. These links are available in the context menu under “Reference links”.



# Product Support (Ordering, Release, etc.)

## Technical Support

Contact ABB technical support via E-mail or your local ABB representative for assistance in problem reporting.

E-Mail: [tech-support-system-solution@de.abb.com](mailto:tech-support-system-solution@de.abb.com)

## How to obtain

Product marketing, technical sales support and order placement:

Dept. DEATG/CES

E-Mail: [tech-support-system-solution@de.abb.com](mailto:tech-support-system-solution@de.abb.com)

Phone: +49 69 7930 4410

License cost is outlined in the price list:

3BDA033517E\_PriceBook\_SystemSolutions

## Deliverables

CD-Rom or DVD medium with PC Toolkit Library for AC 800M and product documentation in English and German. (German language for operation manual only).

For more information please contact:

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