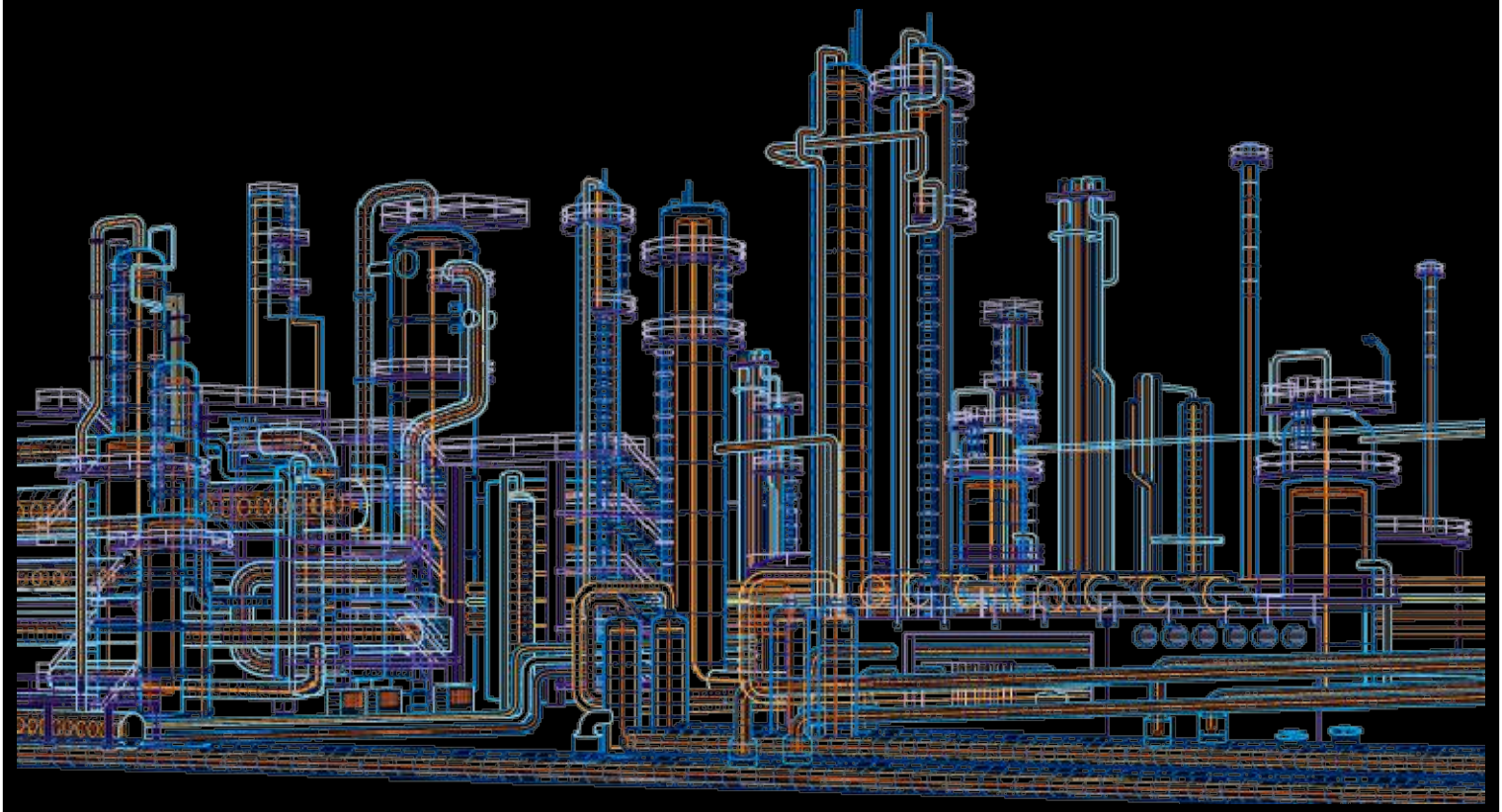


System 800xA

Effect Viewer for AC800M
User Manual

System Version 5.1

Power and productivity
for a better world™

Purpose

The purpose of this document is to describe the PC Effect Viewer for System 800xA and AC800M Connect. The PC Effect Viewer is an 800xA System Extension, which will be used mainly in the Process industries.

Conditions

The PC Effect Viewer can only be used for AC800M object types. The System Extension supports System 800xA V5.1RevA or higher.

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.

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.

Trademarks

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

Copyright © 2015 by ABB.

All rights reserved.

Release: 2013-09-25

Document Number: 3BDA035403R5103EN_Effect Viewer

Table of contents

1. About This Book 4
1.1 General 4
1.2 Use of Caution, Information, and Tip Icons 4
1.3 Terminology 4
2. Product Support 5
2.1 800xA System Software Versions and Extensions 5
2.2 Related Documentation 5
2.3 Prerequisites and Requirements 5
3. How to get started 6
3.1 Program Installation 6
3.2 System Extension Loading 7
3.3 Starting Interlock Viewer Uploader Tool 9
3.4 Updating control data for Effect Viewer 12
3.5 Limitations 12
4. Customizing the Effect Viewer 13
4.1 Customizing Generation behavior and layout 13
4.2 Customizing Generation settings 14
4.3 Customizing Layout settings 16
4.4 Customizing object type definitions 17
4.5 Data type handling 19
4.6 Defining Colors 19
5. Operating Effect Viewer 21

1. About This Book

1.1 General

This instruction describes how to use the Effect Viewer for AC800M.

The aspect type Effect Viewer for AC800M shows the consequences of an output command for the selected object (for example limit outputs of an analog input object type). The Effect Viewer is the counter part of the Interlock Viewer and is used to see what is happening to other objects if a limit is violated or another output is changing.

The display is generated automatically using the control code.

1.2 Use of Caution, Information, and Tip Icons

This publication includes **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 Function Designer Components should be interpreted as follows:

Caution icon indicates important information or warning related to the concept discussed in the text. It might indicate the presence of a hazard which 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 **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, comply fully with all **Caution** notices.

1.3 Terminology

A complete and comprehensive list of Terms is included in the Industrial IT, 800xA - System, Engineering Concepts instruction (3BDS100972).

The following listing includes terms and definitions as they apply to the 800xA system and specifically to the Effect Viewer for AC800M.

2. Product Support

2.1 800xA System Software Versions and Extensions

This table shows the relation between the 800xA Basis version and Effect Viewer for AC800M software package.

800xA	Basic Software Packages	Extension
SV5.1RevA/B/C/D SV5.1FP1/2/3/4	System 800xA for AC800M	ABB PC Effect Viewer V5.1-1

Table 2-1: Major Software Release Versions

2.2 Related Documentation

The following is a listing of documents related to 800xA Operations

Category	Document Number	Title
Operation	3BSE036904-510	System 800xA Operations 5.1
Interlock Viewer	3BDA035401R510x	Interlock Viewer for AC800M 5.1-1/8

Table 2-2: Document References

2.3 Prerequisites and Requirements

- All hardware and software requirements are listed in the user instructions Industrial IT, 800xA Installation / Automated Installation (3BSE034678 and 3BSE034679).
- The System 800xA software and the Interlock Viewer for AC800M 5.1-1/8 must be installed prior to loading the Effect Viewer for AC800M Setup.
- Keep in mind that the high and low limits (H/L) of a control module are used to utilize the good range indication when High Performance Faceplates (HPHMI) are used. This applies for the object types PC_AI, PC_AICALC and PC_PIDx. On account on this the classic faceplate of a PC_AI with 6 limit switches shows 3 high and 3 low limits, whereas the faceplate with HPHMI style guide shows only 2 high and 2 low limits. The remaining pair of limits indicates the good range area (GH/GL). Maintenance people should be aware of this, otherwise they may go confused when comparing the control module configuration against the faceplate indication.

3. How to get started

The Effect Viewer system extension consists of the following two setups.

- ABB PC Effect Viewer 5.1-1
- ABB PC Effect Viewer PC Extension 5.1-1

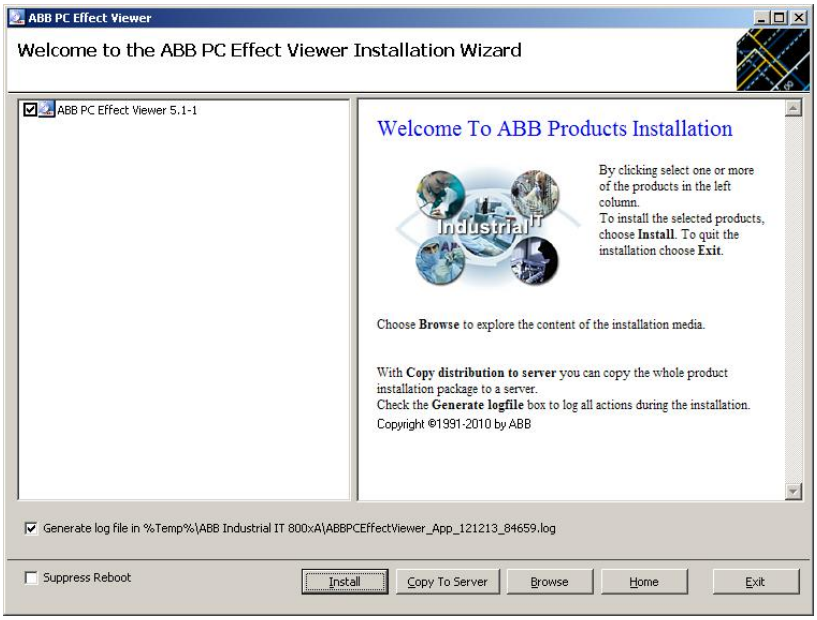
Execute the following steps to get it installed

- Install Effect Viewer and Effect Viewer PC Extension program – refer to 3.1
- Load both Effect Viewer programs – refer to chapter 3.2
- Select a start object in the object browser and generate the Viewer Aspects – refer to chapter 3.3
- for a start, customizing the Effect Viewer settings is not needed). - refer to chapter 3.4
- Select Effect Viewer window by means of faceplates context menu of a locked motor. – refer to chapter 5.

3.1 Program Installation

Install the Effect Viewer for AC800M Setup on all 800xA aspect server nodes and all engineering client nodes).

1. Start the Effect Viewer program “Setup.exe” from the installation folder. Follow the instructions of the Installation Wizard.



2. Activate the option „ ABB PC Effect Viewer 5.1-1“. Clicking **Install a**nd some **Next** buttons starts the installation.
3. Do the same for the Effect Viewer PC Extension program.
4. You can view the successful installation via the log file.

3.2 System Extension Loading

After completing the installation procedures on all 800xA nodes, load the ABB PC Effect Viewer 5.1-1 system extension. This procedure has to be executed once.

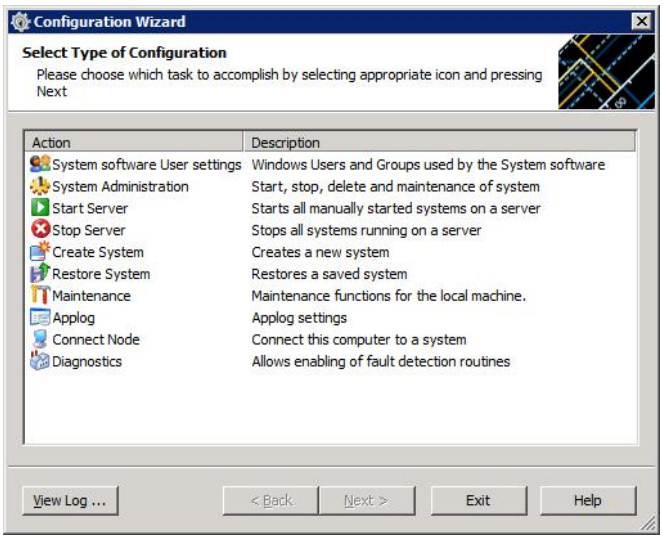
> Make sure that the 800xA System, including the system extensions for the needed control libraries and the ABB PC Interlock Viewer system extension has been loaded prior to starting the following procedure.

Loading the system extension PC Effect Viewer:

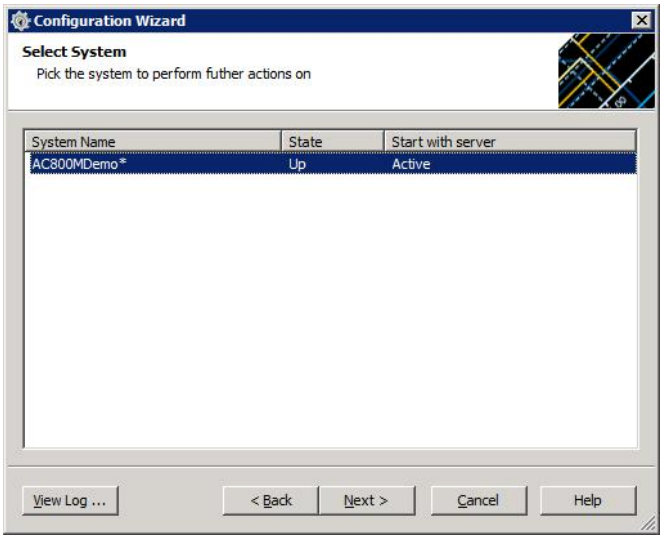
1. Start the 800xA Configuration Wizard.

   Start -> All Programs -> ABB Industrial IT 800xA -> System -> Configuration Wizard.

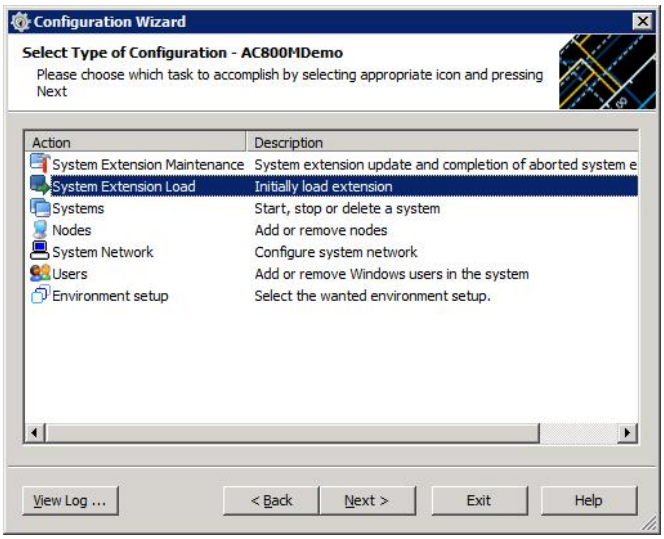
2. When the dialog appears select **System Administration** as type of configuration and confirm your selection with **Next.**



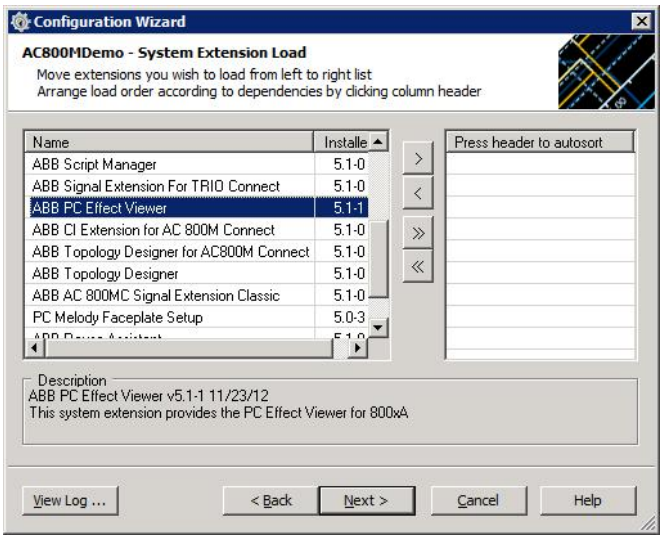
3. Select your 800xA System Name and continue with **Next**.



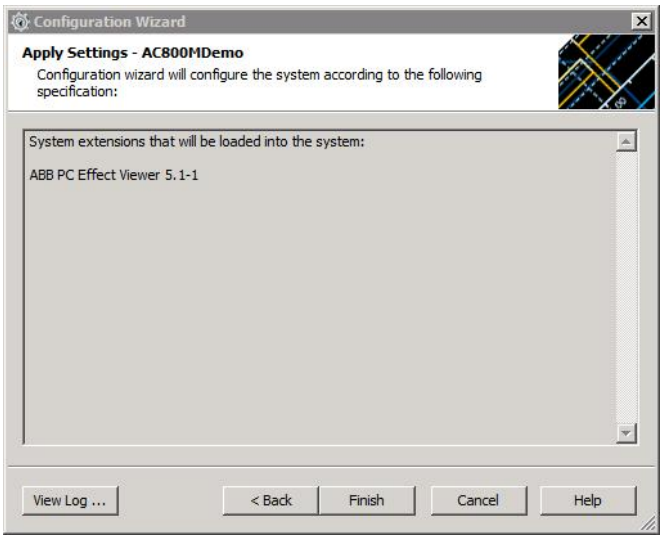
4. Choose **System Extension Load** to initially load the ABB PC Effect Viewer extension. Continue with **Next**. When updating ABB PC Effect Viewer, choose **System Extension Maintenance**



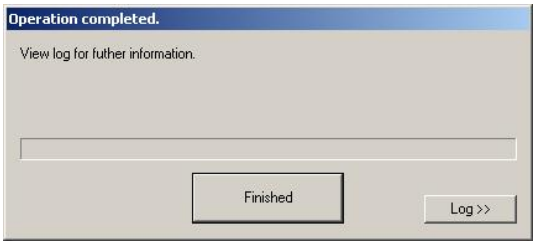
5. Move extension **ABB PC Effect Viewer and ABB PC Effect Viewer PC Extension** to the right list. Clicking **Next** advances to the next dialog.



6. Confirm the start of the loading process with **Finish**.



7. The following window appears after the completion of the load operation. Proceed with **Finished** to the Configuration Wizard.



8. **Exit** closes the Configuration Wizard dialog.

3.3 Starting Interlock Viewer Uploader Tool

The Effect Viewer aspect is generated by means of the PC Interlock Viewer Uploader Tool. It can either be started by opening the program execution file from

- the installation folder C:\Program Files\ABB Industrial IT\Control IT\ABB PC Interlock Viewer\bin\PC Interlock Viewer Uploader.exe on 32bit OS
- the installation folder C:\Program Files (x86)\ABB Industrial IT\Control IT\ABB PC Interlock Viewer\bin\PC Interlock Viewer Uploader.exe on 64bit OS
- the “Interlock Viewer Uploader” aspect from the Root object of the Functional Structure

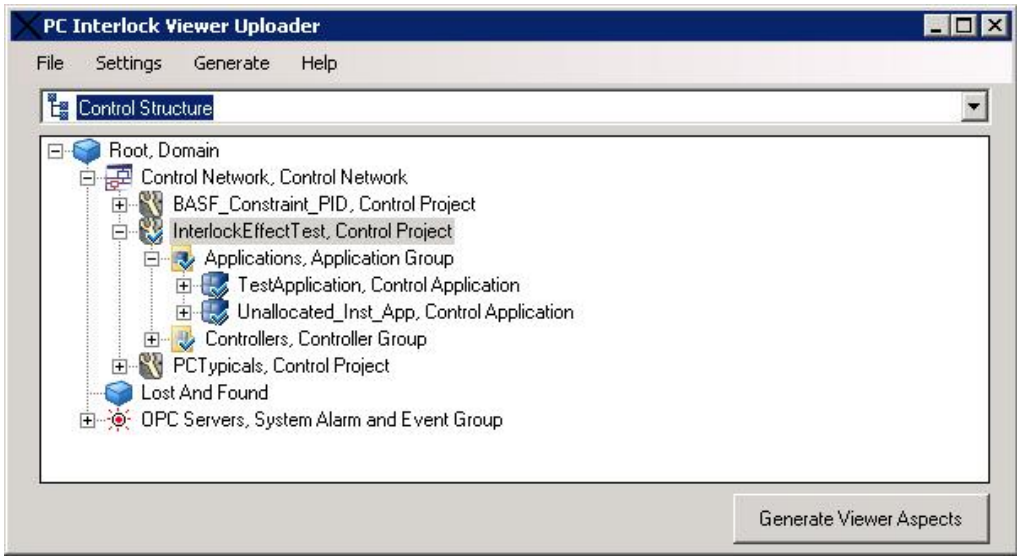


Figure 3-1: PC Interlock Viewer Uploader main window

Select a valid start object and start generation

First select a start object in the object browser. Valid object types are a Control Project, Control Application Group and all objects below these entities. A single object selected will cause the generation of the Effect Viewer aspect for this object only. But the application data will always refresh (if any configuration change is found) for the entire application where the object is located.

After a mouse click on the “Generate Viewer Aspects” button (or select menu Generate → Generate Viewer Aspects) an options window pops up. Here you set additional options for the aspect generation.

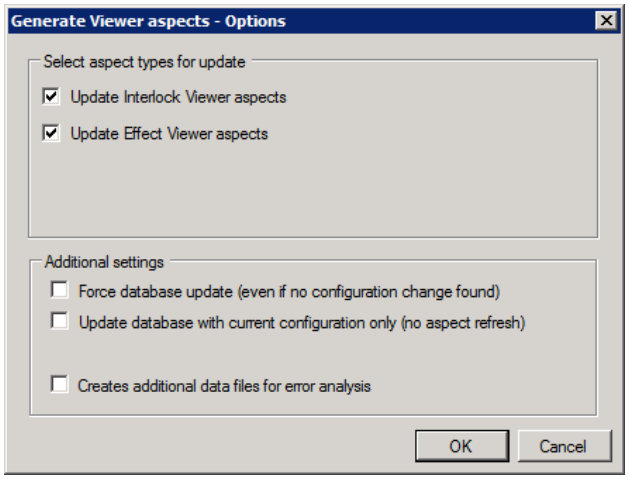


Figure 3-2: Aspect generation – Options

- Select aspect types for update
  - Update Interlock Viewer aspects
    Perform the recreation of the contents of the Interlock Viewer aspects

- Update Effect Viewer aspects
  Perform the recreation of the contents of the PC Effect Viewer aspects.

  At least one option must be select in order to proceed!

- Additional settings
  - Force database update
    Forces an update of configuration data in the internal database, even if no configuration change is detected during check of modification dates.
  - Update database with current configuration only
    If set, the Uploader is updating the configuration data in the internal database, but the viewer aspects will not refresh.
  - Create additional data files for error analysis
    If this option is set, some intermediate XML files are created in the Data subdirectory (C:\Program Files\ABB Industrial IT\Control IT\ABB PC Interlock Viewer\bin\Data).
    This option should only be set on request by ABB service personnel.

The OK button starts the analysis of the control application(s), an upload of the configuration data (if needed) and the generation of graphics data for all Effect Viewer aspects located at the selected 800xA object and its child objects.

A progress window is shown with an overall progress bar (upper bar) and a current step bar (lower). The text field contains the actions that are executed as text.

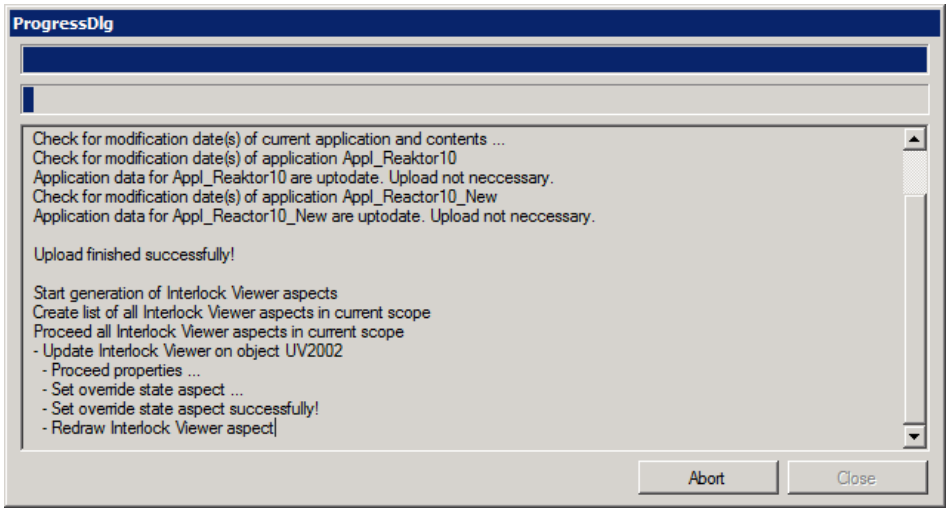


Figure 3-3: Aspect generation – Progress dialog

The upload is finished if a completed message is shown and the Close button is enabled.

The upload may abort either by clicking the Abort button or automatically due to an error reported during upload. The abort request must be confirmed in the Abort dialog. It may take a while until the confirmation dialog is shown.

In case of error please check the log file (available from the main window menu File → View logfile). Make corrections or contact your ABB service organization help is needed.

3.4 Updating control data for Effect Viewer

After every configuration change (If Effect Viewer relevant configuration is changed or the object has moved to another location in the control structure) an upload is necessary. The tool analyses the inputs of the Effect Viewer relevant ports (as described in “Define upload settings”) of the object where the Effect Viewer aspect is located.

The Interlock Viewer Uploader is analyzing the complete control application (where the selected object is located) and stores interim data in a local database.

Prior to the start of the Effect Viewer aspects generation, the modification dates of the aspects of the current application will be checked against the last upload time and a configuration data upload is performed if necessary.

It is recommended that the upload should always run on one engineering client (or server).

Analyzing an application or project may take some time depending of the contents of the application.

Control Builder M must be installed on the client node in order to successfully launch the tool to generate or update the Effect Viewer content.

Be sure that no reserved entities exist during run of the Uploader tool! The execution may fail if an object is reserved by another user.

3.5 Limitations

The Uploader tool has some limitations when reading and analyzing the current configuration from Control Builder M. Configurations that exceed these limitations will not be displayed or do not work properly.

- Programs, Single Control Modules or Control Module types must be configured as FBD (function block diagram) or diagram code. The Function Designer creates FBD (for function diagrams based on single control modules) or diagram code inside the CBM. Connections between Control Modules created by the CMD editor or manually by assigning variables via the connection window of a control module are possible.
- The direction of control module parameters must be defined either by using the direction entry on the control module parameter definition or, if the parameter direction is not defined, by defining the direction in the description (description starts with IN …, OUT …, etc). The definition of the direction entry will be used prior to the definition in the parameter description. Parameters with direction “in_out” are analyzed as input parameters only! Please take care especially when using nested object types with mixed parameters (input and output values in the same parameter). It should not be used in order to create proper Effect Viewer displays.
- The code analyze stops, if:
  - a control module of a function block with a faceplate assigned was found at the opposite side of a variable / connection. The name and the port of object will be added to the Effect Viewer.
  - no source for a variable / connection was found in the uploaded configuration data. This may happen if a variable is defined on an output without any utilization.

4. Customizing the Effect Viewer

4.1 Customizing Generation behavior and layout

The contents and generation settings for the Effect Viewer are stored within the 800xA system.

There are several aspects located at the object “[Object Type Structure]Object Types/PC Interlock Viewer Definitions/PC Effect Viewer Settings”.

Aspects of category “PC Effect Settings” contain solution specific configuration settings delivered by the library development department like for OGP REUSE Solution Library for Oil and Gas projects (ABB OGP Norway) or the PC Library for the process industries (ABB OGP Germany). These aspects must not be changed by a project team. Instead, make a copy of the original aspect and modify as needed. Original aspects that are customized will be overwritten when upgrading the Effect Viewer software

An additional aspect of category “PC Effect User Settings” allows further customization. This aspect contains project specific configuration data. Project specific settings for the same object type and port are higher prior than the library settings.

To transfer the project settings from one system to another system export the “EV project settings” aspect from the source system and transfer it to the target system.

To edit the settings open the Interlock Uploader Tool and select “Settings” -> “Edit Effect Viewer settings”. The configuration dialog is shown.

Change and create library specific configuration settings (Developer mode)

As default only the Project Defined settings can be changed. Library developer can access the library specific configuration settings by entering a password. For password send a request to tech.support.system.solution@de.abb.com. Select the menu “Settings” → “Developer mode” in the Interlock Uploader main window and enter the password to enable the developer mode.

After enabling the developer mode, each predefined configuration setting can be changed. Select the current scope drop-down box (in the lower left corner of the configuration window) and select the configuration that should be changed.

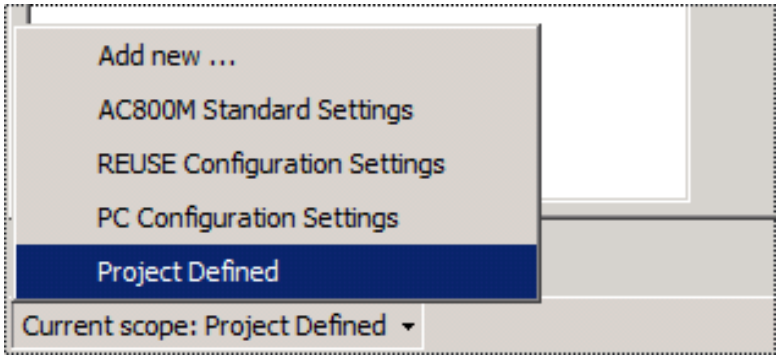


Figure 4-1: Change current configuration setting for editing

The “Add new …” choice allows creating a new setting. The name specified is also the name of the configuration aspect. Only numbers, letters and some other characters (space, underscore) are allowed in the setting name.

Existing configuration settings are deleted by removing the configuration aspect for 800xA.

Library specific settings are valid for object types, data types and modules. Generation and layout settings are always project specific.

4.2 Customizing Generation settings

The “Generation settings” can be modified to the project needs.

Modification on the Generations settings require a recreation of the Effect Viewer aspects by performing a new upload.

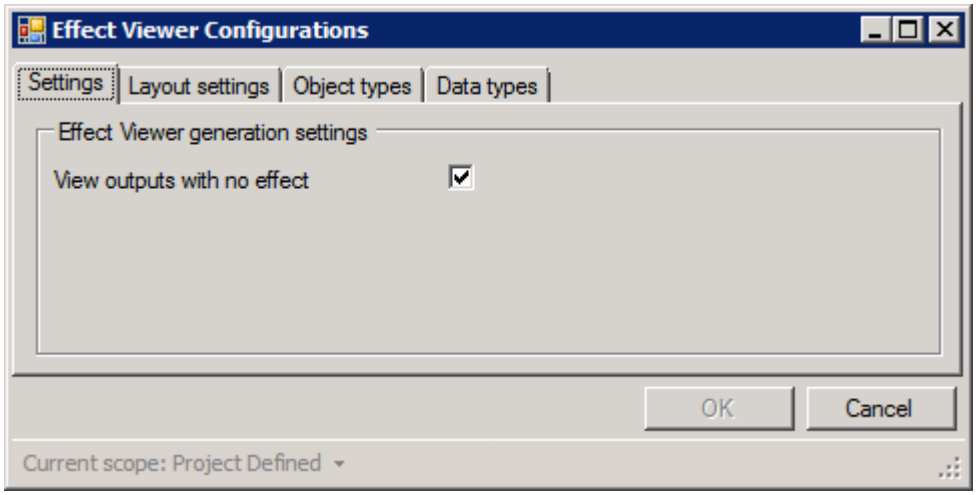


Figure 4-2: Effect Viewer Generation settings

View outputs with no effects

If this checkbox is set, used and unused outputs (Causes) of the current object are indicated. (see Figure 4-3: Effect Viewer with setting View outputs with no effects = True

Or

If this checkbox is not set, only associated outputs that are used and have references to other objects are indicated. (see Figure 4-4: Effect Viewer with setting View outputs with no effects = False)

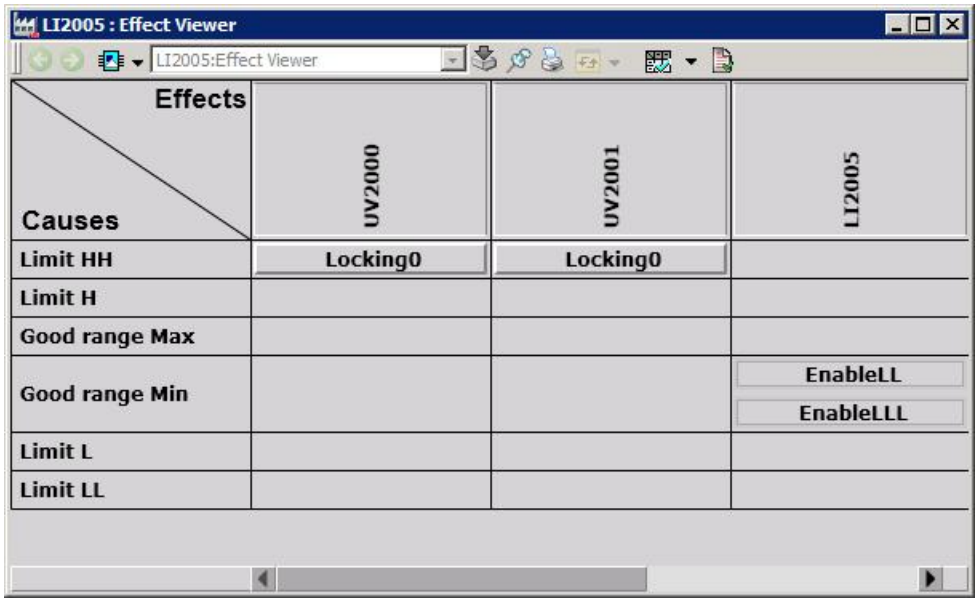


Figure 4-3: Effect Viewer with setting View outputs with no effects = True

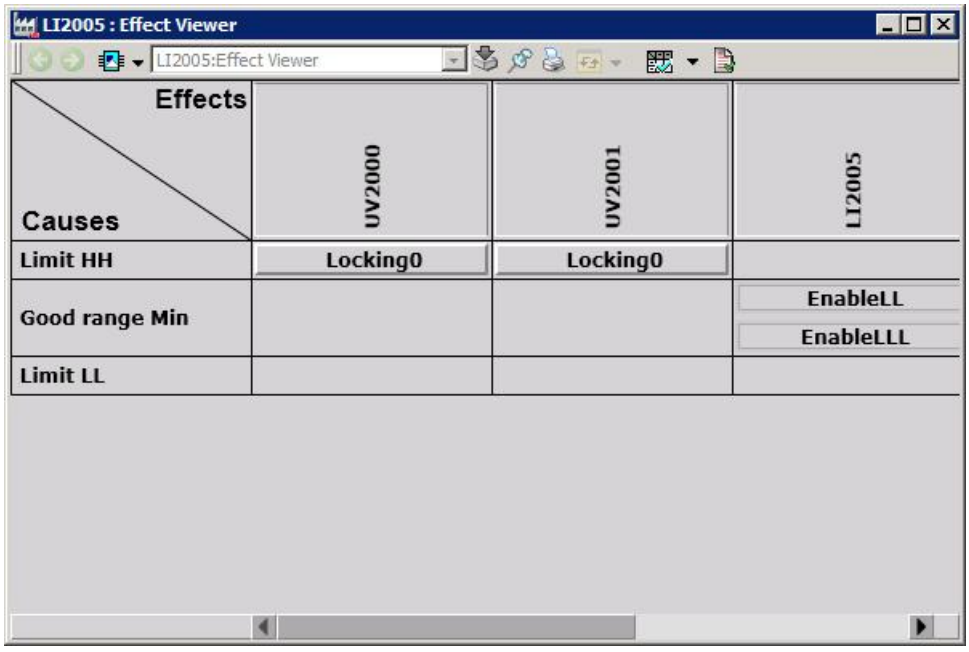


Figure 4-4: Effect Viewer with setting View outputs with no effects = False

Explanation to the figure above: Although no effect for Limit LL is shown, a row is being indicated. Answer: The associate effect is indicated further right. Move the slider further right so the effect and the effected object will be shown.

4.3 Customizing Layout settings

The layout of the Effect Viewer (sizing of the graphic items) can be adjusted without the need of recreating the Effect Viewer.

Changes on these settings will become active directly after clicking the OK button.

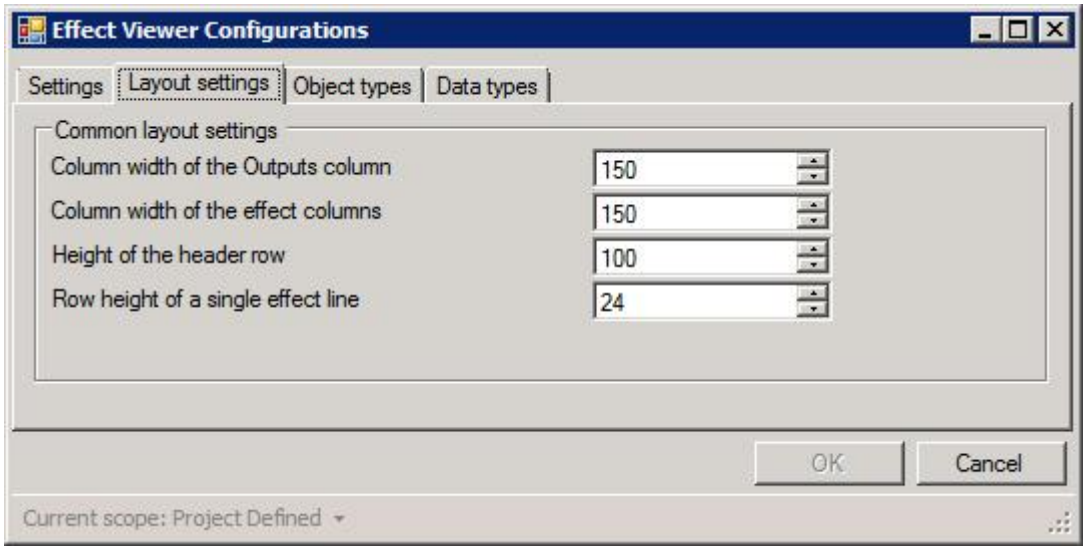


Figure 4-5: Effect Viewer Layout settings

Common layout settings

This section contains general layout settings.

ID	Setting	Description
A	Column width of the Outputs column	Width in pixel of the first column showing the outputs
B	Column width of the effects column	Width in pixel of all column showing effects
C	Height of the header row	Height in pixel of the top row (contains object names)
D	Row height of a single effect line	Height in pixel one effect item (= row height if only one effect for one output on an object)

Table 4-1: Common layout settings

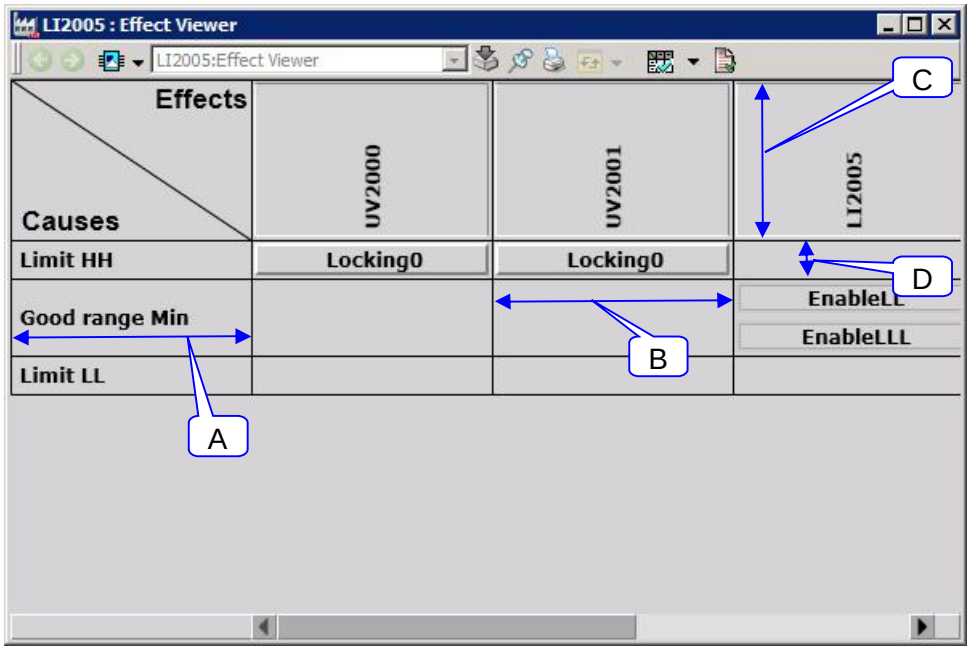


Figure 4-6: Common layout settings

4.4 Customizing object type definitions

In addition of the predefined control modules and their Effect Viewer relevant ports (for example PC-Lib or REUSE object types) it is possible to add own control module types and additional ports or override predefined settings to be displayed in the PC Effect Viewer.

To edit the settings open the PC Interlock Viewer Uploader program and select from the menu “Settings” -> “Edit Effect Viewer settings” and navigate to the “Object types” tab.

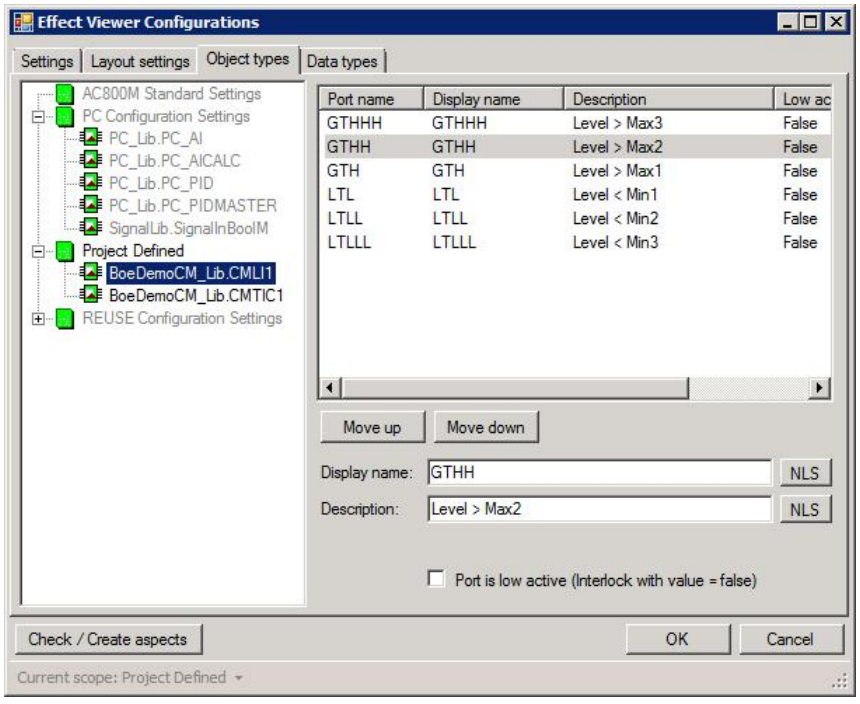


Figure 4-7: Object type configuration

Configuring Effect Viewer relevant ports of object types

For each of the configured outputs of an object type, a row in the Effect Viewer matrix will be created during the upload, if the output is connected to a variable or output reference. New control modules with its outputs or adding outputs to existing control modules can be added by selecting “Add control module type/ports” in the context menu.

Note: The Control Builder must be available on the current node and a project must be loaded for this operation.

A window with a list of the connected libraries for the current project including their control modules on the left pane will open. By selecting a control module all ports of the known data types will be shown on the right pane. Data types can be edited on the fourth tab.
Select one and more ports and mouse click the “Add ports” button to add the selected ports to the configuration definition. If a port is not listed in the “Select object types and ports” dialog, the data type of the port must be added to the data type definition. (see 4.5 Data type handling) or check the direction of the port. Only ports those are defined as input will be listed here.

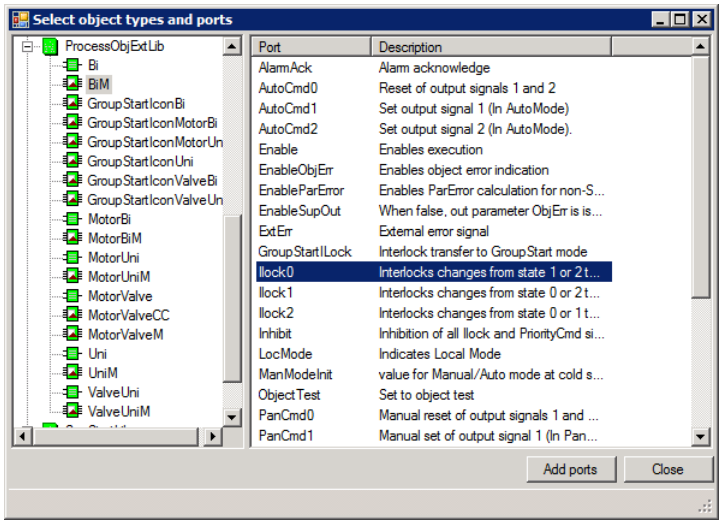


Figure 4-8: Add ports to object type definition

Added ports can be configured separately. Select the port and change the Display name and its description (shown as tooltip) in lower right pane.

Display name and description it is also prepared for NLS (National Language Support). Click on the NLS button right of the text field and select a valid NLS resource name. It can also be defined manually by using the following syntax “nt::<Object name>:<NLSID>”. The object name is the name of the object where the NLS aspect is located.

The Effect Viewer shows the relevant outputs in the same order as it is shown in the configuration. The order of the Effect Viewer relevant inputs can be changed using the Move up/Move down buttons. Output with the same display name will be merged to the same row in the Effect Viewer matrix.

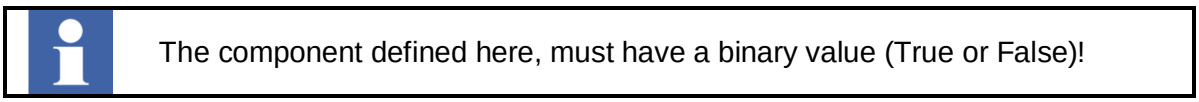
The needed aspects are created automatically on the defined object types. After defining the object types and Effect Viewer relevant ports click on the button “Check / Create aspects”. This will check all defined object types, if an Effect Viewer aspect

exists. If not, the aspect is created with the required settings (copy to all instances). The aspect creation may take some time. An upload is not possible at this time.

4.5 Data type handling

The PC Effect Viewer will only analyze outputs of known data types.

In the “Data types” tab of the Effect Viewer Configuration window, data type and their default component can be defined (Example: Data type = BoolIO, Component = Value).



The component defined here, must have a binary value (True or False)!

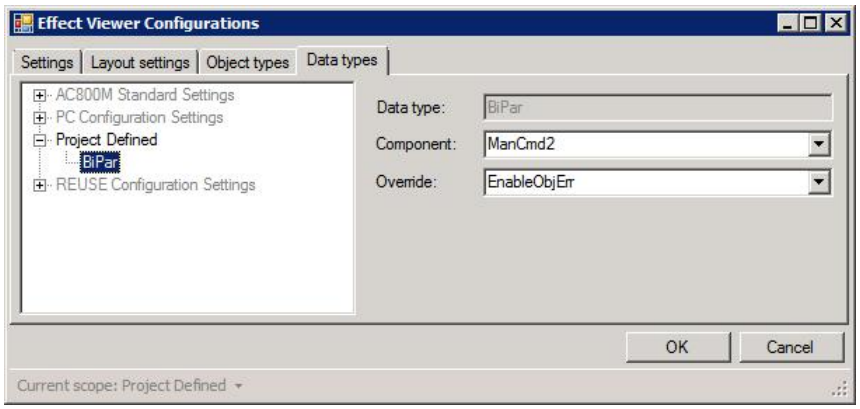


Figure 4-9: Data type definition

4.6 Defining Colors

The colors used in the Effect Viewer can be defined in the “PC Interlock Viewer Colors” aspect (located at [Workplace Structure]Web System Workplace). In addition to the color definitions for the Interlock Viewer there are few colors for the Effect Viewer.

Color name	Color	Discription
PCEVOutputActive	RGB(255,255,0)	Color of the selected object (causes) if active.
PCEVOutputEffectActiveIL	RGB(220,150,150)	Color of the effect indication if the input of the effected object is an interlock input and was triggered by the selected object.
PCEVEffectActiveIL	RGB(250,220,220)	Color of the effect indication if the effected object is an interlock input but was not triggered by the selected object.
PCEVOutputEffectActive	RGB(100,150,200)	Color of the effect indication if the effected object is not an interlock input but was triggered by the selected object.
PCEVEffectActive	RGB(220,230,240)	Color of the effect indication if the effected object is not an interlock input and was not triggered by the selected object.

Table 4-2: Color Settings

This table shows the relationship between the output (causes) being active or none active and the effects used for interlock input or none interlock inputs.

An effect that was caused by the selected tag and the effect results in an interlocked motor or valve is indicated with a strong color (magenta) PCEVOutputEffectActiveIL.

An effect that was probably not caused by the selected tag and the effect results in an interlocked motor or valve is indicated within the same color family but a lighter color (light magenta) PCEVEffectActiveIL.

The same applies to effects that do point to none interlocked inputs. The colors are then blue PCEVOutputEffectActive and light blue PCEVEffectActive.

Cause active	Effect active	Effect is int. locked	Colordef for the Effect	Color name
0	0	0	transparent	
0	0	1	transparent	
0	1	0	RGB(220,230,240)	PCEVEffectActive
0	1	1	RGB(250,220,220)	PCEVEffectActiveIL
1	0	0	transparent	
1	0	1	transparent	
1	1	0	RGB(120,160,210)	PCEVOutputEffectActive
1	1	1	RGB(220,150,150)	PCEVOutputEffectActiveIL

Table 4-3: Effect Color Coding

The color indication of an active cause will always be yellow (PCEVOutputActive).

5. Operating Effect Viewer

The Effect Viewer window is available at faceplates or graphic elements for the object types motor or valve which can have interlocks or operating conditions. Select the Viewers window by a mouse click on the Interlock tab of the faceplate or by using the context menu of a faceplate or graphic element.

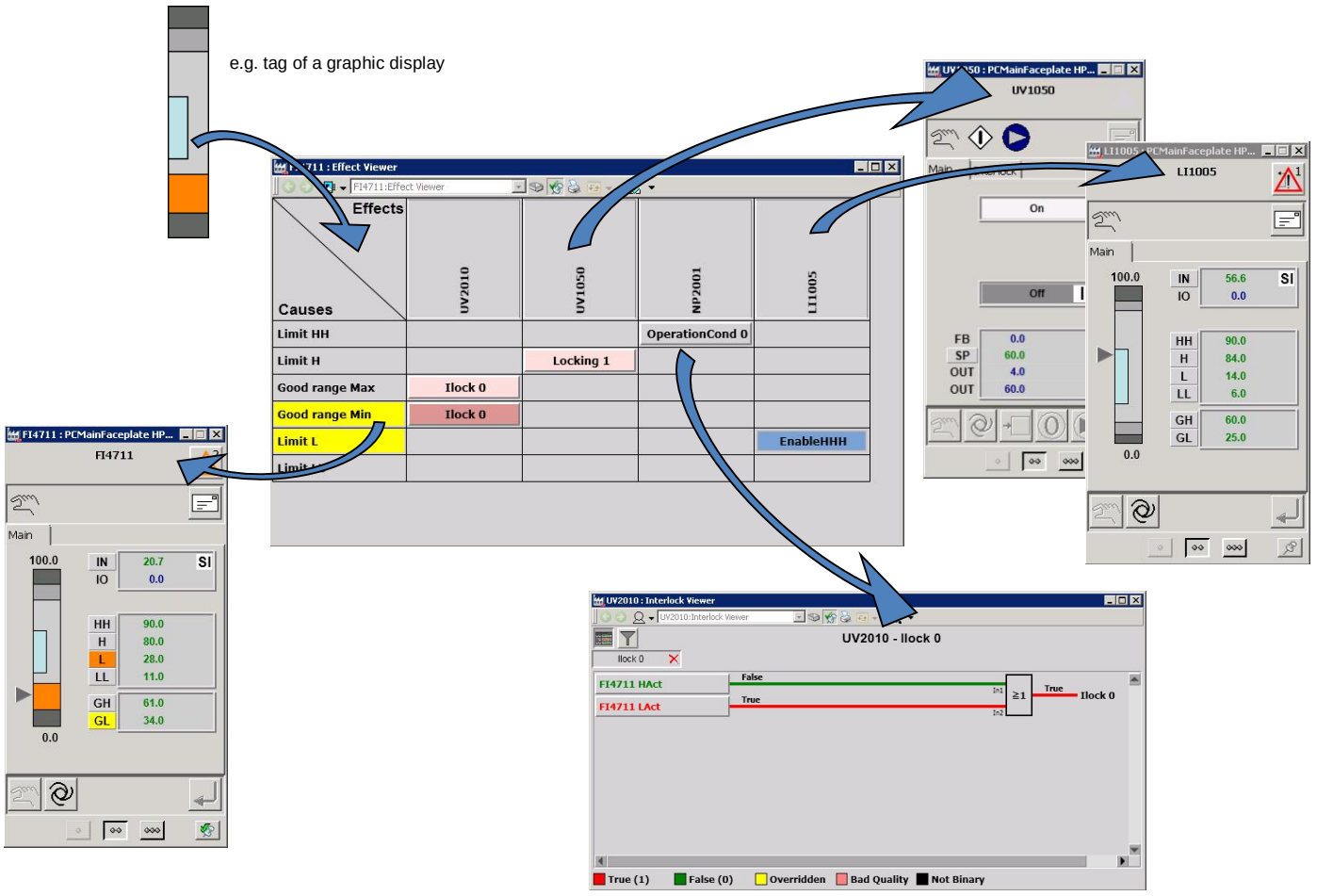


Figure 5-1: Effect Viewer Navigation

The Effect Viewer indicates all possible effects based on the outputs of the current object in a matrix view.

All objects that may get affected by outputs (causes) of the selected object are indicated at the top row. The left column indicates the outputs of the selected object. Both, top row and left column are sensitive for mouse clicks and bring up the default aspect (normally the faceplate).

For each configured and relevant output one row is shown in the matrix. A slider at the right side and the bottom side is invoked if necessary.

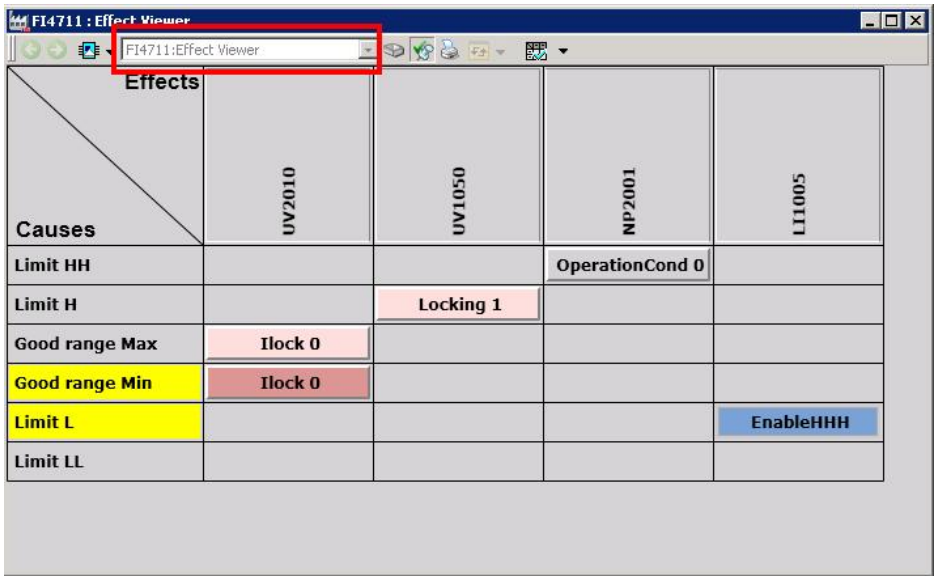


Figure 5-2: Effect Viewer

Explanation of the picture above:

This is the Effect Viewer display of the tag FI4711 (red square) which was called by either its faceplate or a graphic display.

Effects that do point to an interlock input of the target object (according the Interlock Viewer configuration) are indicated as emphasized button. A mouse click the button opens the Interlock Viewer of the target object.

The actual states are color coded (for color values see chapter 4.6 Defining Colors).

- Active outputs are filled with color PCEVOutputActive (Example FI4711 Good range Min → Limit L)
- Active effects that are not used for interlock inputs are filled with color PCEVOutputEffectActive (Example LI1005 EnableHHH.
- Active effects that do point to an interlock input but are triggered by another output (not the selected tag) are filled with color PCEVEffectActiveIL (Example FI4711 Good range Max → UV2010 Ilock 0).
- Active effects that are probably caused by the current output and point to an interlock are filled with color PCEVOutputEffectActiveIL (Example FI4711 Good range Min → UV2010 Ilock 0).
- None active effects are display in background color.

3BDA035403R5103EN_Effect Viewer Germany 2013-09-25

Copyright © 2013 by ABB. All Rights Reserved
® Registered Trademark of ABB.
™ Trademark of ABB.

BU Oil, Gas and Petrochemical
Frankfurt, Germany
www.abb.com/Chemicals